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NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter, March 4, 1924, at the Post Office at Washington, D. C., under the Act of March 3, 1879

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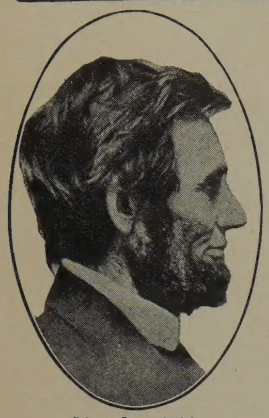

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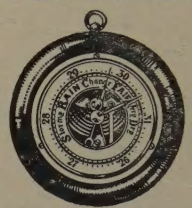

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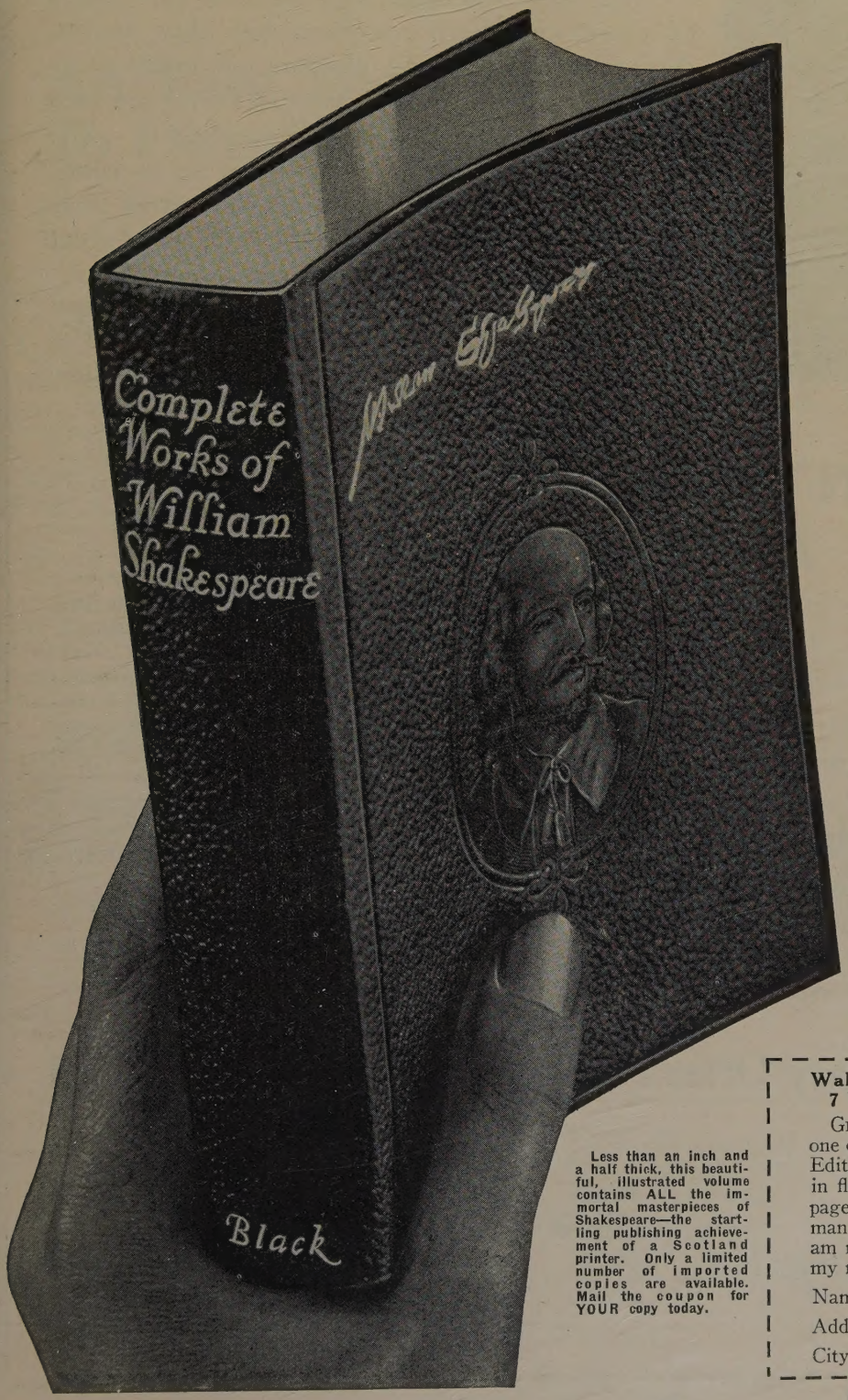

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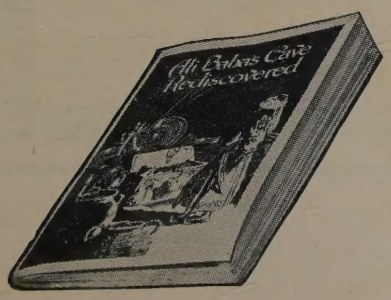

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"LUNCHING ON A ROBIN'S EGG"

NATURE MAGAZINE

Vol. V MARCH, 1925 No. 3

"At the gates of the forest, the surprised man of the world is forced to leave his city estimates of great and small, wise and foolish. . . . Cities give not the human senses room enough."—EMERSON.

The Wit of a Red Squirrel

By WILLIAM L. AND IRENE FINLEY

Of the National Association of Audubon Societies

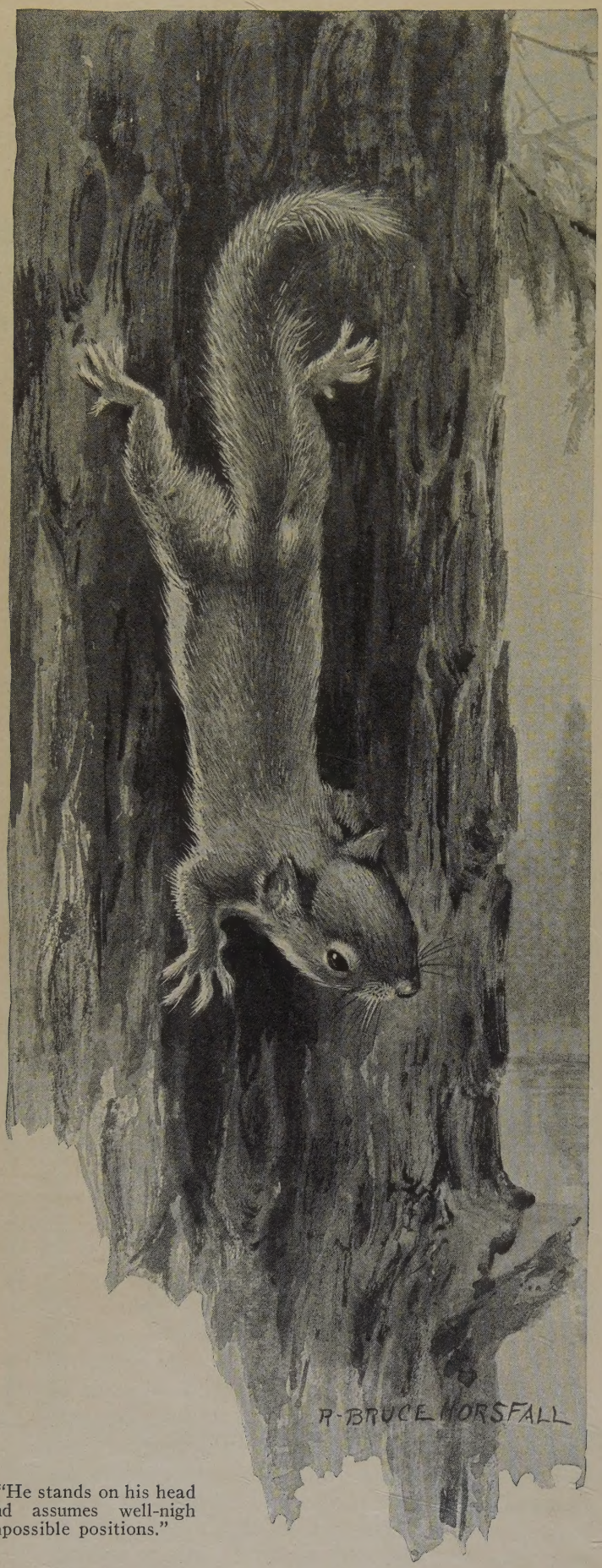
YEARS ago before we built our home, we had a little cabin on the lower part of our ten acres by the river. We used this for a summer camp and for occasional outings the rest of the year. One day in mid-winter when I went out to work around the place, I put my lunch on the table and at the side of it I laid three apples. The morning was spent cleaning up some brush, but at noon when I entered the cabin, I noticed the apples were gone, while the rest of the lunch was untouched. I thought someone had played a joke on me and was hiding nearby. I looked all around and waited, but no one appeared.

The disappearance of the apples puzzled me. They were not in the cabin, not even in the stove, the woodbox or under the sink. As I was down on my knees looking under the cupboard, my eye happened to catch a tiny bit of peeling in the corner. It looked like a clue. If someone had eaten my apples, the cores and even the seeds were gone. I went outside, examined the ground, and climbed to the roof. Of course I knew a pair of red or pine squirrels lived in the big Douglas fir, but I hadn't heard or seen them during the morning. Besides, I saw no way a squirrel could get the apples out of a closed cabin.

The more I thought of the matter, the more I felt the pair of squirrels might know the whereabouts of my apples. I climbed up the steep wooded hill toward the fir. Looking across in a maple tree, I saw one of the apples in a crotch twenty feet from the ground. Another was in the crotch of the next tree higher up. On the branch of the fir, with his tail curled over his back, sat Mr. Douglas Squirrel enjoying the third apple.

Going back into the cabin, I said to myself: "If the little fellow will tell me how he did it, I will gladly give him four times as many apples." Looking over the situation, I discovered a round hole that looked about the size of the apple up in the corner just below the shingles. One of my apples looked to be a pretty good sized load for a squirrel. I decided he had sunk his teeth into each apple and climbed straight up the side of the wall. The tiny bit of peeling I had discovered in the corner showed he had had difficulty at least with one apple. He had surely earned the fruit; the joke was on me.

The red squirrel of the east, often called Chickaree, and the red, pine or Douglas squirrel of the Pacific Coast, with their near relatives, live in most of the wooded country of America north of Mexico. Wherever there are forests of pine, fir, spruce or hemlock, from the seashore to timberline on a snow-capped peak, and beyond the trail's end in the forest, you may find the red squirrel with a jerking tail



"He stands on his head and assumes well-nigh impossible positions."

at one end and a chatter-box at the other. He flashes from branch to branch with an outburst of energy. His playground is the trunk of a tree. Dashing up, he circles, then swings around the rough bark, stands on his head and jumps into almost impossible positions.

On the Pacific Coast, Chickaree is a sleight-of-hand artist in the matter of his clothes. He changes with the climate. In the humid, heavily wooded region bordering the Pacific, he wears a coat that is rich, dark brown, but underneath it changes to a beautiful orange tone. A day's travel from there to the eastern slope of the Cascades, and his dress changes to grayish above and tan instead of orange below. Another day's travel to the east, and the little fellow is paler gray with white under parts, more like the Chickaree of the Atlantic.

John Muir called the Douglas squirrel "Pillil-looeet," an Indian name. Pronounce it rapidly with the first syllable heavily accented, and it is not unlike the call of the squirrel when he is excited. The typical note is his explosive, musical whistle—clear and emphatic. He sings this for his own pleasure and amusement. Sometimes it has a pleading tone. His rapid trilling song is often drawn out with longer or shorter cadences. At times, he gives a peculiar note that is very birdlike in character, quite enough to deceive one into thinking he is about to meet a strange feathered friend.

"He is the mockingbird of squirrels," sums up John Muir, "pouring forth mixed chatter and song like a perennial fountain: barking like a dog, screaming like a hawk, chirping like a blackbird or a sparrow; while in bluff, audacious noisiness he is a very jay."

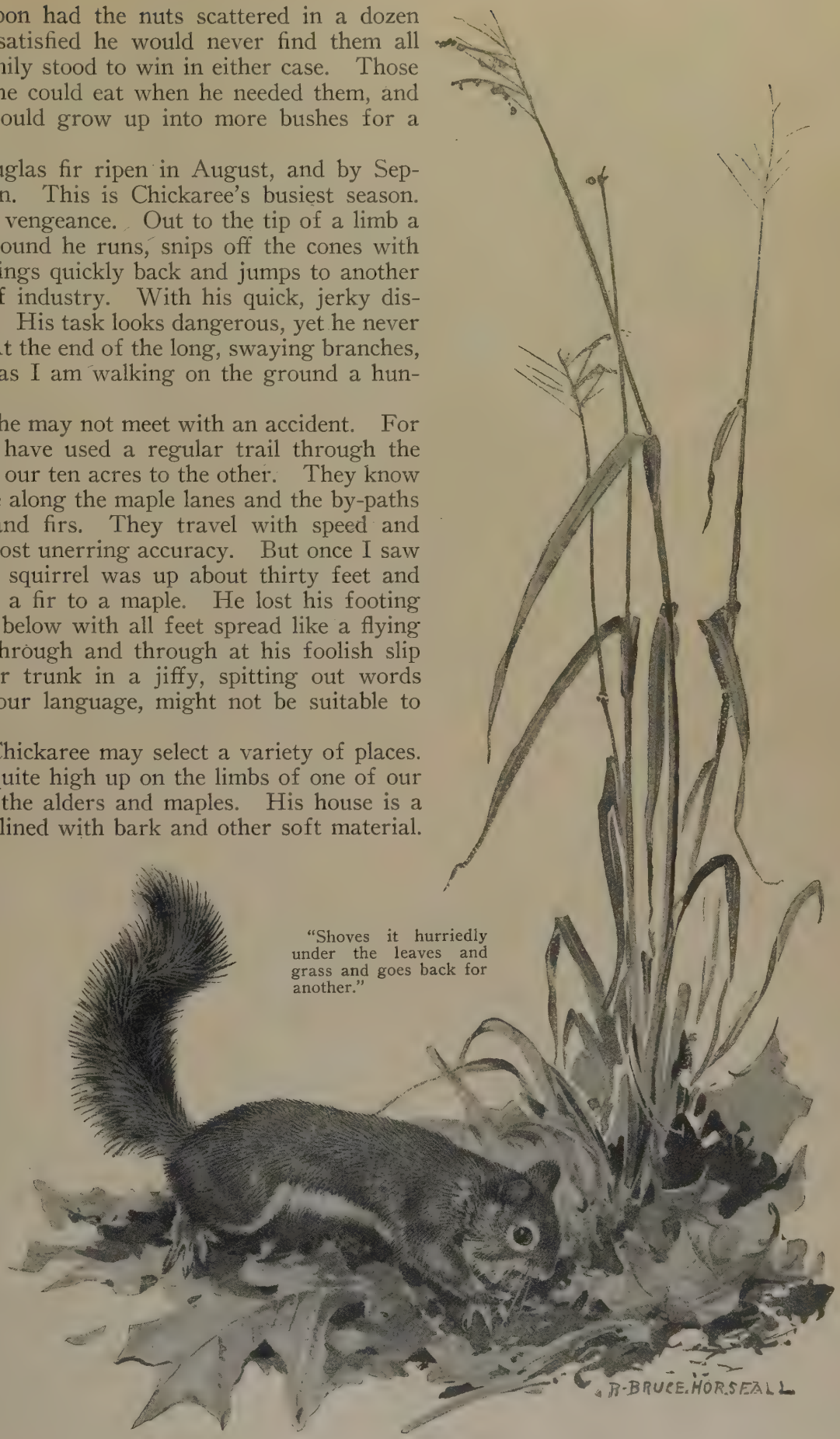
When we come to study Chickaree's habits, shall we ever know his real influence in planting seeds and the distribution of our forest trees? Nearly every fall when the hazel nuts are ripe, we watch him gathering his store on our side hill. He never travels any distance on the ground but always follows his aerial runways across the bridges of the limbs. One day, when he was busy, I sneaked around through the trees to the bottom of the hill. He was making regular trips about fifty yards up to some hazel bushes. I marked the spot where he was storing nuts in a hole in the ground. When I thought he had finished, I sneaked over and, clearing away the covering of dry leaves, I dug out twenty-three nuts. Before I could replace them and get away, the squirrel had discovered me. He was as mad as an old hen when her chicks are bothered. He sputtered and chattered until I went away; then he ran down, uncovered the store, and one by one got the nuts out in a hurry. He was so excited he would grab one and run off a short distance, shove it hurriedly under the leaves and grass, and go back

for another. Thus he soon had the nuts scattered in a dozen different places. I was satisfied he would never find them all again, yet the squirrel family stood to win in either case. Those that he did find later on he could eat when he needed them, and those he failed to find would grow up into more bushes for a future harvest.

The cones of the Douglas fir ripen in August, and by September they begin to open. This is Chickaree's busiest season. He goes at it with such a vengeance. Out to the tip of a limb a hundred feet from the ground he runs, snips off the cones with his scissors-like teeth, springs quickly back and jumps to another branch, the very model of industry. With his quick, jerky disposition, he is never slow. His task looks dangerous, yet he never seems to miss his hold. At the end of the long, swaying branches, he is just as sure-footed as I am walking on the ground a hundred feet below.

But this is not saying he may not meet with an accident. For years, our pine squirrels have used a regular trail through the tree-tops from one side of our ten acres to the other. They know the exact branches to take along the maple lanes and the by-paths of the dogwoods, oaks and firs. They travel with speed and guide their steps with almost unerring accuracy. But once I saw an accident. A Douglas squirrel was up about thirty feet and jumped from the limb of a fir to a maple. He lost his footing and landed in the bushes below with all feet spread like a flying squirrel. He was mad through and through at his foolish slip and scampered up the fir trunk in a jiffy, spitting out words which, if interpreted in our language, might not be suitable to print.

In building a home, Chickaree may select a variety of places. He generally has a nest quite high up on the limbs of one of our firs or in the hollows of the alders and maples. His house is a warm structure of twigs lined with bark and other soft material. He does not sleep away the winter as the chipmunk does, so he must store up for a rainy day. He carries off fir and pine cones and always some of our walnuts, sometimes accumulating them at the base of a tree, under the shelter of a log, or hiding them in crevices and crannies of the ground. He has a remarkable way of locating these stores when they are needed, even when they are under cover of the snow. Like his store of hazelnuts, if they are not found, his cache serves the purpose of reforestation.



"Shoves it hurriedly under the leaves and grass and goes back for another."

But the red squirrel is not the only sprite of our

woods. He is one of three varieties of tree squirrels that are found living near our home. The big squirrel we call the silver-gray has much the same habits of storing his food and nesting in the trees, but he is twice the size of his red cousin. The flying squirrel with his large eyes, like the owl, is a creature of the night. He differs from the red squirrel by the extension of his skin which spreads out like a cape along his sides between his front and hind legs. When he leaps from one tree to another, he glides on a downward, sloping course like a small parachute. He springs into the air with considerable force, but the distance he can "fly" depends upon the elevation from which he starts. By this unique method of traveling from the top of one tree to the base of another, he can bridge the gaps in a way that no other squirrel can. Strangely enough, however, with all his remarkable equipment, the flying squirrel cannot make as good time through the forest trees as the red squirrel. The airplane method of gliding down and then climbing up makes a longer course.

"Snips off the cones with his scissors-like teeth."

All the tree squirrels are expert climbers and have somewhat the same habits of home making and storing up provisions for a rainy day.

We once made a little box roofed over and sheltered from the weather as a winter feeding place for the squirrels, and supplied with nuts, wheat and corn. When the Chickarees discovered it, they raced around gesticulating with their tails and pouring out a torrent of excited comment. Then they set to work to carry away everything in the box, hiding the food in crannies in the trees and holes in the ground. Although the store would not be half as safe from the elements as it was in the box, it was scattered and hidden from other woods folks who might want a bite. The pine squirrel is not inclined to look after the interests of other people. He is as faulty as some humans. Indeed, his sharp tongue, quick wit and inquisitive nature have led him into some bad habits.

In April, a pair of robins had built a nest about twenty feet up on one of the limbs of the white fir that stood just below our house, and the mother robin had been sitting on four eggs. One day, I noticed she was off the nest. She did not return during the morning, and in the afternoon she was still away from home. Something had happened. I climbed the tree to a point from which I could look into the grassy cup. The eggs were gone.

The robins built another nest in the same tree just seven feet from the ground where two small bushy limbs had sprouted from the trunk and made an ideal nest spot. Then one day they began calling in such an excited manner that I knew they were in trouble. I rushed down the hill and, coming around the tree in sight of the nest, I saw to my amazement my friend, Mr. Red Squirrel,

(Continued on page 152)

The English Setter

By J. HORACE LYTLE

ALTHOUGH there are plenty of persons who are in total darkness as to the great worth of bird dogs, the fact still remains that they are, and have always been, among the most popular of all the breeds. The Field Dog Stud Book in Chicago registered in 1924 almost twenty thousand setters and pointers; and the number for this year will unquestionably exceed that figure by several thousand. And this does not include the bird dog registrations with the American Kennel Club, which during the past year has waked up to a very active interest in these dogs—nor does it take into account the many setters and pointers which, through one cause or another, have not been registered in either stud book.

Yet it is not surprising that these splendid dogs should be so popular with those who know them, because surely no dogs are more worthy than they. I have all my life been a lover of good dogs, of various deserving breeds, but for the deepest love and loyalty give me the bird dog every time. And this is not so strange, for they have for generations been the closest companions of man. The collie in his natural environment does wonderful work, but he is able *unaided* to handle cattle or sheep. The hound is a great companion and helper in the hunt, yet it is within his power to complete his job without help of any kind. And so it is with others of the working or sporting strains.

Not so with the bird dog. He is helpless without his master, and his master is almost equally helpless without his dog. One needs the other; each one alone can carry the job only so far. One takes it up where the other ends. And it is just this thing which, it has always seemed to me, is the one biggest reason behind the marvelous brain of the bird dog. He has been developed through years of helpful companionship, sharing his master's joys and hardships, successes and failures. Nothing brings out the best in a dog like companionship, as witness the great heights to which sledge dogs often rise in their work on the Arctic trails. This thing of a great equal partnership in the field, with all that partnership means, is what is behind making the bird dog—as it is my personal opinion he is—the peer of them all, no matter from what standpoint his worth is considered.

Naturally, the benefits of such companionship as is indulged in between bird dog and master is not all one sided. The dog is an inspiration to the right sort of master. Many are the accounts of both head work and heroism on the part of the dog, and particularly is this true in the case of the bird dog. If you don't believe me, just sit around some time and listen while a couple of old hunters get warmed up to their favorite subject. You won't be long getting an earful.

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"CHAMPION NOBLE STONE WARRIOR"

A bird dog is helpless without his master, and his master is helpless without him.

Nick Daniel told me the other day that one time when Fanny Buckalew, his favorite English setter bitch, was nursing a litter of puppies, she did something that displayed the type of brain power which is so

often seen in the great bird dogs. It seems that Nick was awakened in the dead of night by Fanny scratching and whining at the front door. He was sleeping on the first floor, and commanded her to quit it, but she only became more frantic in her efforts to get in. He was about to get up when she came crawling through the window and jumped to his bed and promptly proceeded to nose him out in no uncertain manner. Fanny led her master quickly to the kennels, where Nick found one of the puppies hanging by the neck. He had somehow gotten caught in a rope that had been thrown over the wire netting. Nick worked hard and fast to revive the strangled puppy, which finally started breathing again.

"And that puppy," said Nick in telling it, "was Cowley Buckalew—the greatest field trial prospect I ever owned."

As far back as 1872 Edward Laverack published a book on the English setter, but long before that comparatively recent date the dogs were bred in England based upon private records. The setter achieved popularity long before the pointer came into the limelight, and one of the really remarkable things about the situation is that the setter does not seem to have lost many of his old admirers even though the pointer has of late years been gaining ground by leaps and bounds. In fact, since 1918, when the setter dog, Joe Muncie, won the National Championship of Field Trials, none but pointers have won this historic stake. And still the setter breeders have not wavered in their loyalty and are sure their favorites will "come back," as we ourselves believe they will.

The difference between setters and pointers is *not* that which a friend of mine thought it was: "The strangest thing of all to me," he said, "is how instinct prompts the setter to indicate birds in one way and the pointer in another."

"What do you mean?" I asked.

"Well, don't setters 'set,' and pointers do—something else," he answered.

His total of innocent ignorance on the subject so astounded me that I might almost have thought he was jesting had I not known that such was not the case. And so, since there may be others laboring under the same apprehension, let us explain that there is absolutely no fundamental difference between the respective attitudes of either breed on game. Both *point* in exactly the same manner. Any differences are individual characteristics and not collective. When the body scent of game birds reaches the sensitive organ of either setter or pointer, he, or she, indicates the presence of game by "pointing." Some point with low head, some with high; some with low (or dead) tail, some with "flag" pointing proudly skyward. *Style* point is something that every true sportsman desires to see—and style calls for head held high, one front paw drawn up, tail elevated above the perpendicular, eyes staring, and nose tensely seeking the scent ahead. There you have, for the true fancier, the prettiest picture that any artist could possibly paint!

NOSE TENSELY SEEKING SCENT

"For the true fancier, the prettiest picture an artist could possibly paint."

We have said that there is no fundamental difference in the respective attitudes of a setter and a pointer on game. Personally, I can see but few fundamental differences in their *work*. Some say the setter has the merrier manner of going, and perhaps that is true. Certainly, however, the pointer is less bothered by burrs, and is not so susceptible to thirst. The pointer is probably bolder, and, as a rule, easier to break on birds. Aside from these few, it is my opinion that any differences between setters and pointers are purely differences of individuals and not collective in any sense of the word.

Setters and pointers have a common purpose—to seek and find game birds, and to *point* them

when found. Dogs that do their work in the most pleasing manner have what we call "class." They are fast, and they go wide in open country, carefully and close in heavy cover. They will point the body seen only of game birds, and do so by assuming the most striking attitudes. This warns the hunter of game, after first filling the eye by the pleasure of watching a "class" dog work. Things that count are speed, range, bird sense, judgment, nose, being biddable and having character and courage. The combination of all these makes the superlative bird dog.

There are today over a hundred important field trials for setters and pointers held in all parts of the country. Many of these are followed chiefly by the professional handlers, but the organizations for amateurs exclusively are on the increase. In September we have the trials on the Canadian prairies, where the game bird is the prairie chicken. Then we start a string of trials in October on quail, grouse and ring-neck pheasants. Pennsylvania and Michigan have the grouse trials, while New York, Ohio and a few other states have contests on the ring-neck pheasant. The central west and south follow the quail, while out in the great northwestern states the contests are run largely on the Hungarian partridge. Ohio now runs three important bird dog field trials, on quail, with interest keener all the time. There are more bird dogs in Ohio today than there have been for many years.

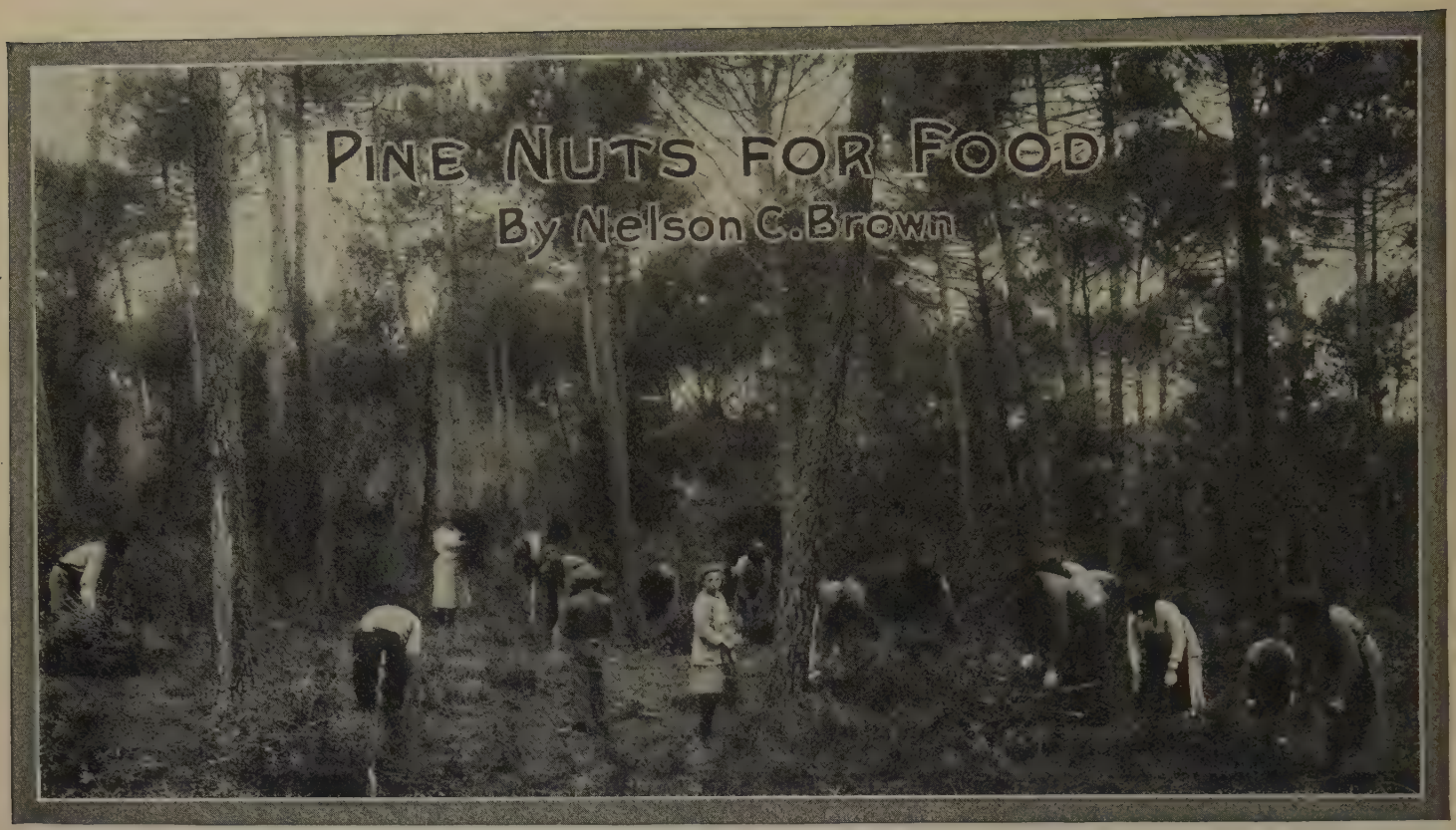
INTERNATIONAL NEWS REEL

BLUE RIBBON SETTERS

"Del Bright Sensation" and "Malwyd Ed-Rollo," dogdom stars.

It is the writer's opinion that these field trials are proving a great boon to the best interest of the birds. It is an old axiom of the trials that "the quality of the performance is more important than the frequency of the occurrence." The whole aim is for a dog that will do his work in a *high class manner*. The pleasure to be derived from owning a "class" dog is from watching and enjoying the *way* he works, even more than the mere results he may achieve—for results that are not deserved are not given the same consideration as otherwise. His *manner of going* is all-important, coupled with bird sense, judgment, courage and nose. If you go afield with an old plug of a dog, he has nothing to offer in the way of a thrill, so the only thrills produced come with the kills—as you match your arm and eye against the brain and speed of the flying target. The dog has not raised a spark in you, but, on the other hand, the zest of markmanship does.

Take, on the other hand, the case of those of us who are privileged to go afield with fast, wide-going, stylish dogs. We are fascinated more by the work of the dog than anything else. There isn't a dull moment as he flits gayly from one piece of cover to the next. If we are hunting, we want, of course, to make a bag, but that's never the big thing. That's merely incidental. The big thing is the pleasure of being afield with a dog that is always going "high, wide and handsome." And, since that is the case, we find ourselves taking our pals afield without a gun just as often as with one. The truth of this theory was exemplified just recently, before our season closed, when two of us had gone afield with a brace of my favorite setters. It so happened that these dogs, which the previous season had worked so beautifully together, had suddenly developed a tremendous jealousy of each other. We were constantly trying to get them over it and always hoped that each new trip would find our efforts successful, but on the day in question they seemed worse than ever. Each one would try to steal the other's point, and once there was a deliberate flush by one of them rather than appear to lose the honor of the find. Up to this time I had not fired a shot all day, but was using my efforts to get the dogs steadied down to business. On this occasion, however, the birds flushed in such a way as to fly right by me, and I should easily have been able to kill one or two of them. There was something more important than merely killing game. The *means* is more important than the end.



BEFORE us lay a deep green forest bathed in the warm sun high in the dark blue sky of the Italian Riviera. From Florence we had come seventy swift miles down the enchanting valley of the Arno to this old world palace in the heart of the pines. Within, its panelled dining salon and tapestried halls and rooms hung with ancestral paintings bespoke centuries past; without, its domain of fifteen thousand acres, beyond which bulked the Pisan Mountains to the east and sparkled the Mediterranean to the west, tells an interesting story, past and present.

It was the ancestral summer home of the Duke of Salviati, a Roman family of noble and ancient lineage whose penchant was the out-of-doors, the forest and the chase. We had come, the chief inspector general of the Royal Italian Forestry Service and the writer, to inspect the forest of which the present Duke of Salviati is justly proud. Yet it was more than an ordinary forest we had come to visit, for it was one grown now and for many generations for its yield of pine nuts for food.

We sat on the portico resting from the ride, reflecting upon the interesting fact of this forest. In the United States there are about thirty-five distinct and separate pines. Throughout the world there are many more. To be sure we had heard of a pine that grows in Arizona and New Mexico and yields the Indians nourishing pine nuts to augment their food supply. But here was a pine nut farm of trees, yielding annually for hundreds of years its product of small, cream-colored, sweet nuts from the "umbrella" pine whose high-spreading crowns so often stand out against austere gray rocks and azure shores in Italy.

A younger member of the family, Count Vincenzo Pesciolini, took us in charge to show us over the large forest. We had completed a delightful luncheon when two brakes swept up. There were two because an inspection of a forest in Europe takes on somewhat the nature of a rite, and besides the Count, the inspector general and myself, we were joined by the chief forester of the ducal estate, the forest inspector of the Pisa district and two local forest guards.

The forest was a wonderland of beauty and a model of efficient forestry practice. For several hundred years it had been under systematic management. Every hundred years the mature trees were cut and the cut-over area reborn with seeds or young trees. Each year an area amounting to one hundredth part of the whole is cut over, so there are one hundred such compartments each containing trees of the same age. On every side of each of these were laid out forest roads that acted as fire lines. The forest floor was clean and the younger growths carefully thinned out. Above, the trees were well trimmed to the crowns.

These pines go by the Latin name of *Pinus pinea.*

WAGON LOADS OF RICH PINE NUT CONES

These two-wheeled carts are a familiar sight in the forest districts of Italy.

They are prolific seeders, and each October and November they shed on this estate between 6,000 and 7,000 cubic meters of cones, large and heavy, and not unlike the big Digger pine cones of California. They range between three and five inches in length and up to three inches wide at their greatest diameter.

Fresh fallen, the cones of this pine are like a stubborn clam — hard to open. So they are collected in the fall — the gathering is an important local industry and period of harvest happiness—and allowed to bask in the warm rays of the Italian sun until the following June. Then, mellowed by its softening influence, the cone scales have opened and many of the nuts, still surrounded by a hard shell, drop out or are easily threshed out in a special machine devised for this work. After drying further, the remaining shell is cracked and the nuts are ready for market in the early fall.

SPREAD OUT TO BASK IN ITALIAN SUN

The cones are left to dry from the fall until June, when the luscious nuts are more easily obtained.

To the pastry, candy and cake shops of Italy these nuts go to make toothsome confections. They are exported to France, England, Belgium and to the United States, to about a quarter billion pounds a year. In some years the gross revenue of the Salviati acres, including the return from wood cut and sold, has amounted to a million lire. The thinning of the annual area yields about fifteen thousand board feet of lumber and several cords of wood each year.

Great care is taken of the growing forest. During its development large numbers of young trees are thinned out to allow the sturdiest to grow even stronger and produce the greatest quantity of nuts. This solicitous thinning starts when the stand has attained ten years and continues every three years until it is thirty-five years old. From then on thinning takes place every six years, leaving the most beautiful specimens of trees with their spreading

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Dutchman's Breeches

By ALBERT A. HANSEN

THE DRAB forest floor of northern woods during late winter and early spring is frequently enlivened by interesting patches of light green, lace-like leaves. If you clasp a cluster of these leaves firmly at the base, a slight tug will expose the white, scaly bulbs of Dutchman's breeches, one of the earliest and handsomest of woodland wildflowers throughout the region of the Alleghany Mountains and as far west as Kansas, Nebraska and Missouri.

During March and April, the nodding, attractive, two-spurred blossoms appear. The shape of the flower solves the mystery of why so handsome a plant bears such a commonplace name, because it must be admitted that the form of the blossom is suggestive of the broad pantaloons so characteristic of the costume of Dutch youngsters. White hearts, another name by which this delightful plant is known, seems to be a more desirable appellation for this charming woodland dweller. But after all, what's in a name?

The most noticeable feature of these pure white, yellow tipped blossoms is the two prominent spurs, at the base of each of which a nectary is hidden that offers sweet reward to the early bumble bees. The plant was highly valued as a love charm by the North American Indian. The young swain was supposed to cast a spell over his intended either by hitting her with the plant or by chewing the bulbs and allowing the young lady to get the scent of his breath. The object of all this attention is supposed to follow her wooer as soon as she gets the scent, even though it be against her will. To many, the greatest attraction of Dutchman's breeches is furnished by the delicate, gracefully dissected foliage that forms colorful, lace-like patterns on the leaf mould in which the plant is so commonly found.

Although an unusually handsome and innocent appearing species, recent research has demonstrated that Dutchman's breeches is in reality an exceedingly dangerous plant. The manner in which this discovery was made is very interesting. Since the times of the earliest pioneers in the highlands of Virginia, heavy losses of stock have occurred during spring before the grass develops. Suspicion was directed at several species of early-appearing plants, prominent among which was Dutchman's breeches. Since the most prominent symptom exhibited by the poisoned animals was staggering, the species under suspicion were popularly known as staggerweed, and Dutchman's breeches was generally known among Virginia highlanders as "little staggerweed."

PHOTO L. W. BROWNELL

REASON FOR THE NAME IS PLAIN

This plant, with white, yellow-tipped blossoms and lacy foliage is a spring bloomer.

On account of the frequent losses due to staggerweed poisoning, the United States Department of Agriculture undertook feeding experiments with a number of the suspected plants, the results of which were recently announced. The tests demonstrated that all parts of Dutchman's breeches contain a heretofore unknown poisonous principle that is highly toxic to cattle and that is undoubtedly the cause of stock losses. Since the plant grows typically in loose leaf mould, the bulbs yield easily and the grazing animals thus get a double dose of the dangerous poison.

In spite of its dangerous qualities, however, Dutchman's breeches will probably always be prized as an odd and delightful spring wildflower.

A Feathered Buccaneer

By H. S. BRYANT

United States National Museum

"A LARGE New Zealand parrot in three letters." Pencils poised, fully half the nation has hesitated over this sticker in the cross-word puzzle. It is a sticker no more, however, for all our cross-word puzzlers—which represents a large part of our citizenship as well—have made dictionary acquaintance with this bird. Yet he has a more interesting story than Mr. Webster's much-consulted volume can contain.

The kea derives its name from the sound of its cry. It is an awkward looking-member of the parrot family, known to the scientific student, and, no doubt, soon to the puzzle makers, as *Nestor notablis*. It is a little larger than our common pigeon and, while varying considerably in individuals, is generally olive-green in color with a band of brick-red or flame-colored feathers over the base of the tail and a large patch of similarly colored feathers under each wing. A touch of the same red, sometimes shading almost to a yellow, appears also on the shoulders when the wings are not tightly closed. The head is flat and is provided with a long, sharp, curved beak. The bird is an adept at hopping, covering a considerable distance with great speed, but when walking it moves with an ungraceful waddle, and its legs are so short that its tail often drags on the ground. The four toes on each foot are armed with strong talons.

KEA, BIRD BUCCANEER

This New Zealand parrot has brought upon himself near extinction.

In Washington, D. C., the National Zoological Park is particularly fortunate in owning a splendid group of these birds—fortunate because they have become rare through their own bad habits. In its cage, the bird has developed its natural curiosity into many forms of precociousness which serve both to delight the visitors and annoy the attendants. It has acquired the most consummate dexterity in turning on the water tap that fills its bathing pool and also in removing the outlet plug and filling the drain pipe with small pebbles, and seems to possess an uncanny knowledge of when to do the one or the other in direct opposition to the wishes of the keeper.

The inquisitiveness of the kea is one of its most striking characteristics and the one to which is probably due its near extermination and present rarity. Like our own passenger pigeon, which has become entirely extinct within the memory of the present generation, the kea has practically disappeared within the past sixty years, but because of its viciousness instead of its palatability.

We must go back to New Zealand during the exceptionally hard winter of 1867 to find the beginning of the kea's downfall. At that time the herders first began to notice many sheep afflicted with what they supposed to be a new disease. Many animals were found with patches of wool torn off their rumps, the flesh being torn and mauled or showing sores in various stages of healing. There was much speculation as to the cause and suspicion fell upon several birds of known carnivorous tendencies, and even wild dogs were accused, but the suggestion that it might be the little kea, so long known as an inoffensive, vegetable-feeding bird, was received with ridicule.

Meanwhile the conditions among the sheep grew steadily worse, as though immunity from punishment encouraged greater boldness. Suspicion was pointed directly to the kea, and poisoned meat betrayed it to be the culprit.

A war of extermination was begun on the feathered butcher and a price put upon its head. The herders went armed, and a wholesale slaughter was commenced. Of course it could have but one result, but it was not to be achieved without great difficulty. The kea developed a wonderful wariness. Its particular time of attack, when the light was most uncertain, was well chosen for its own protection, but it was wise enough to vary the time of its assaults and frequently would find its prey in the dead of night.

To destroy its nests and young was next to impossible, for the kea does not build a nest in the ordinary sense of the word. It selects for its home a crevice or tunnel in the rocks, high up among the almost inaccessible crags above the timber line and usually where the entrance to its run is partially obstructed by rocks or boulders so as to leave only room enough for the bird to squeeze through. Here, some four or five feet back from the entrance, a few sticks are laid down to form the nest. Even when the hardy hunter succeeded in reaching the entrance to the run, he was apt to find that a crowbar or explosive was necessary to gain access to the nest. Moreover, in addition to the natural inaccessibility of the nest, the keas were still further protected by the peculiar fact that their eggs are laid and the young hatched and reared in midwinter in a region swept by fierce storms, where long, deep snows and biting frosts prevail for extended periods.

But the birds' doom was sealed. Continued slaughter has so nearly exterminated them that they are rare. Though they are no longer a menace to the New Zealand flocks, the occasional finding of a sheep that has been slaughtered by keas serves as a reminder of the days when the bird was a menace to the industry that played so important a part in the settlement of this rich land.

(Continued from page 144)

The Wit of a Red Squirrel

whom we had long called Piney, on the edge of the nest lunching on a robin's egg he held in his paws.

I reached for something to throw. There was nothing at hand but a little stick. I hurled it with all my might. The little wretch dropped the shell and scampered up the tall fir.

"I'll fix you for this," and I clambered up, swung my leg over the lowest limb and started after him toward the top. At least I would teach him not to rob birds' nests. This tree was tall and in the open, so he could not get away. I would get him in the very top and with a big shake catapult him clear out into the garden. It would give him a scare that would teach him to keep out of the tree.

I had reached the topmost branches where the trunk was slender. He saw he was cornered. He watched me from the very tip. Just as I hooked my leg around the tree to give the top a big flip, he sprung lightly out into the air, and sailing downward, caught the end of a bushy branch about eight feet below me. Before I could descend, he had run down the trunk and was chattering as if he thought it was a good joke.

I was exasperated. There were three eggs left in the nest. Perhaps I had scared him enough to keep away. I would keep close watch on the remaining eggs. Two days later they were gone.

We had fed and watched and enjoyed the pine squirrels for years here on the hillside. Piney was so attractive; but now we were losing faith in him. Here was a little fellow with long, gnawing teeth whom Mother Nature had raised to eat nuts and seeds; yet how had he become so depraved as to steal eggs and even young birds? Did he have weasel blood in his veins? If he was bent on murder, I should have to get rid of him.

It is a queer world, this out-of-doors in which we live. Not far away is a neighbor who insists that all robins should be killed because they eat his cherries and strawberries. Another wants a bounty on moles that are such a pest in his garden and lawn. Another neighbor advocates the killing of hawks, owls and cats. Another feels that insect pests will in time take everything. A letter from a man in Pennsylvania states that there ought to be a campaign started to exterminate the red squirrels in order to save the birds. I am on the point of killing those that live on my place.

If we begin a campaign of extermination, just where is it to end? If we put ourselves up as judges, we must look at things from all angles. We are told that all forms of life fit into their places like the stars in the solar system. The lives of all the animals about us are worked out on a plan of checks and balances. If we eliminate some species that appear detrimental, we may destroy nature's equilibrium and are likely to have greater difficulties than before. If we could destroy all the red squirrels, as some advocate, who would take the place of these little foresters in all parts of our country?

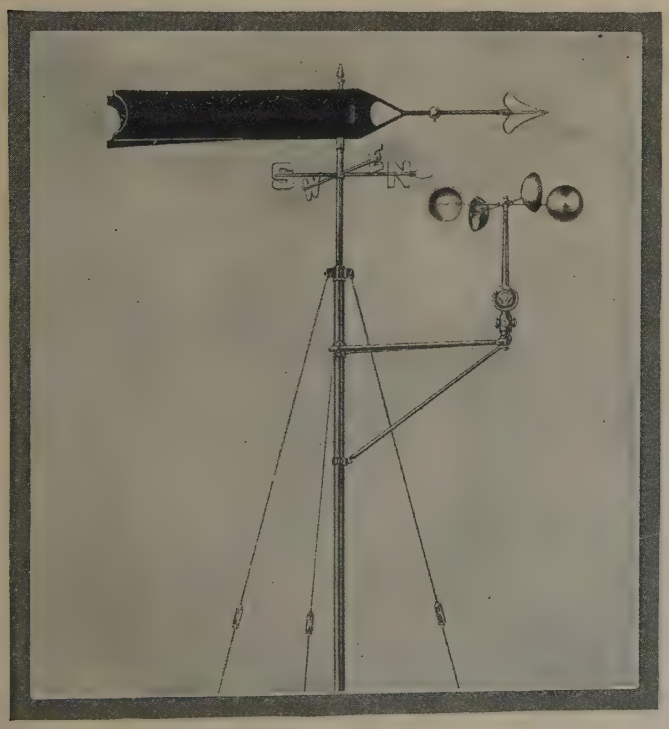
Here is Pillillooeet: he chatters and barks through our tree-tops. In spite of his faults, we love him. When we go down by our spring, he begins to scold as if he owned the place. The ivy and the grapevines have grown thick in the alders and cedars for many years, and there are matted places and old holes where he lived long before we came. We have decided that he may always have dominion over these.

The Story of the Winds

By CHARLES FITZHUGH TALMAN
U. S. Weather Bureau

IN MANY parts of England the curious custom prevails of describing the quarter from which the rain-bearing winds blow as a "hole." The word, in this sense, is always used in connection with the name of some locality. About Shrewsbury, for example, you hear people say, "There'll be rain, for the wind has got into Habberley Hole"—Habberley being a village to the southwestward of that town. In Ashford Vale, East Kent, it is Bodjham Hole that is said to breed the rainy winds, and at Dunstable, Bedfordshire, it is Flammer's Hole. In parts of Lincolnshire, Wrawby Hole and Marnum Hole are heard of in a similar connection.

Probably these expressions are mementoes of that far-off time when even the wisest philosophers believed that many winds had their origin underground, in caves. This belief was founded upon the now well-known phenomenon of "blowing caverns." Perhaps you have visited one of these caverns. There are several of them in the United States; the most famous being the one to which the Wind Cave National Park, in South Dakota, owes its name. A typical blowing cavern has two openings at different levels. In summer the air in the cave is colder and heavier than the air out of doors, and therefore flows out of the lower opening, while air is drawn in above to replace it. In winter the circulation is reversed; the air in the cave is warmer and lighter than that outside, and escapes at the top as from a chimney, being replaced by air drawn in below.



WIND-VANE AND ANEMOMETER

Note the spread tail of the vane for keeping the arrow steady in the wind.

PHOTO U. S. NAVY

QUEEN OF THE SEAS OF FORMER DAYS

She is sailing in a wind of about Force Three on the Beaufort Scale, which runs from 0 (calm) to 12 (hurricane).

Of course these local air currents are of small importance in comparison with ordinary winds, and our forefathers were mistaken in supposing that the latter originate in the depths of the earth. Yet it is an interesting fact that the little breezes produced by blowing caverns and the mightiest winds that sweep over the face of the globe are due to the same primary cause; viz., differences of temperature.

The process of wind production is illustrated every day in your kitchen. The air over the stove is heated, expands, and becomes lighter, volume for volume, than the surrounding air. It rises, though not, as people often say, "because it is light." Expansion starts it upward, and the surrounding cooler and heavier air presses in and helps to raise it. This cooler air is heated in turn and rises for the same reason. While the air at the lower level is flowing toward the stove, that near the ceiling is spreading out and settling down, and thus a circulation is established.

Consider, now, what happens on a larger scale in the case of the earth's atmosphere as a whole. In place of the hot stove we have the surface of land and water in the equatorial regions, strongly heated

by the vertical rays of the sun. Here the air, warmed by the warm earth, rises and flows away toward the poles, at the same time gradually sinking and eventually flowing back, at the earth's surface, toward the equator.

Unfortunately for meteorologists and the people they attempt to enlighten, many other things happen

MEASURING THE "WIND ALOFT"

Twice each day the Weather Bureau releases "pilot balloons" to observe the drift of lofty air currents.

at the same time and the process is greatly complicated. The most important complication is due to the rotation of the earth on its axis. This has the effect of turning all winds aside from the path they would pursue if the earth were stationary. The deflection is to the right in the northern hemisphere and to the left in the southern. Another complication results from the seasonal change in the angle at which the sun's rays strike any part of the earth, causing a dislocation of some of the principal winds, alternately northward and southward, in the course of the year. Then there are the different heating effects of land and water, the changes of temperature between day and night, the effects of mountains and other features of the land surface, and numerous effects due to the moisture in the atmosphere which not only modify the main winds of the globe but also play a part, and often a leading one, in the control of less important atmospheric movements.

Without going further into the philosophy of this complex subject, let us consider a few facts about the nature of wind in general. Most people think of wind as always moving horizontally or else at a slope corresponding to that of the ground. Actually, however, winds may blow at any angle to the horizon, and some blow straight up or down. These vertical air currents are common in thunderstorms. The uprushing air in such storms sometimes attains

TOWER OF THE WINDS, ATHENS

This octagonal building bears figures symbolizing the winds from each quarter.

a speed of 2,000 feet or more a minute. Air is cooled by expansion when it rises and heated by compression when it descends, and both processes have far-reaching consequences in the regulation of weather. Most rain, for example, is due to rising air, which cools and condenses its moisture, while certain winds remarkable for their heat and dryness are due to the

descent of air. Another prevalent idea about wind is that it consists of a mass of air moving steadily and with approximately the same speed in all parts. Such a wind is a rarity, and perhaps never occurs near the earth's surface. A normal wind is full of waves and eddies, and it flows past any particular point in a succession of gusts and lulls. These irregularities in the wind are revealed by the movements of smoke pouring from a chimney on a windy day, and there are special types of anemometer, or wind-measure, designed for registering them.

"How strong was the wind?" is the question asked after a destructive storm. The answer to this question is likely to be misleading, because it is nearly always stated in terms of *speed* rather than *force,* and the two things are not identical. The force of the wind can be indicated accurately by saying what pressure it exerts (in pounds per square foot, for example) upon a surface at right angles to its path. This pressure varies approximately as the square of the speed. Thus a wind of twenty miles an hour blows about four times as hard as one of ten miles an hour, and a wind of thirty miles an hour blows about nine times as hard as one of ten miles an hour.

MONUMENTS TO THE TORNADO'S FURY

All that was left of two splendid trees after this most violent of winds had passed.

PHOTO RENÉ BACHE

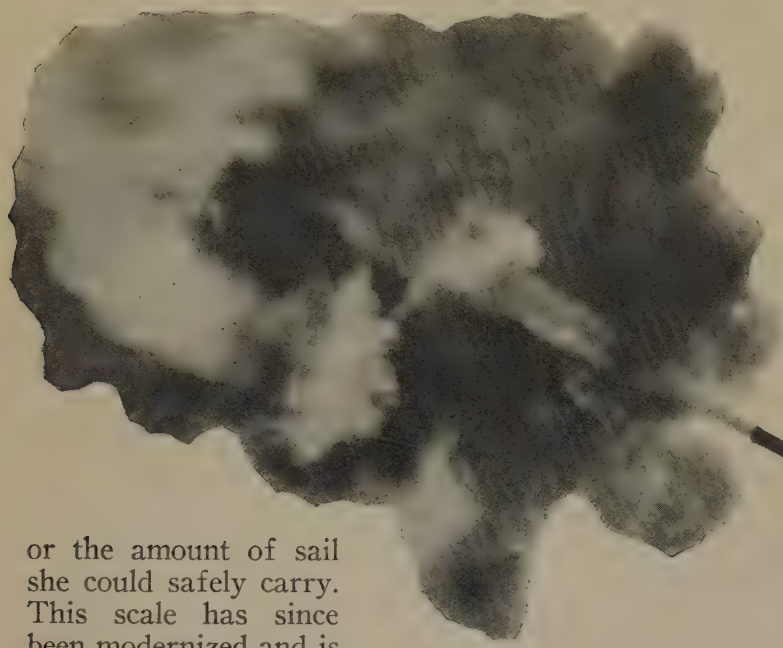
HARNESSING THE WIND IN THE ORIENT

This odd Chinese windmill is pumping sea water for evaporation in making salt.

The commonest instrument for measuring the speed of the wind is the Robinson anemometer, consisting of four (or, in a recent pattern, three) hemispherical metal cups at the end of arms that turn on a vertical axis. The cups travel less than half as fast as the wind, and the relation between speed of cups and speed of wind is variable, but there are rules for computing the latter from the former. The movement of the cups is shown by a dial and is, in many cases, registered by a pen connected electrically with the instrument. Measuring wind is not a particularly satisfactory process. In the first place, no simple measurement can take account of all the rapid fluctuations —gusts and lulls—which, as already stated, are characteristic of most winds. In the second place, the force of a wind nearly always increases with height above the ground, so that two anemometers at different heights give quite different indications. At many stations of the Weather Bureau the anemometers are placed at a great height in order to escape the screening effect of surrounding buildings. This has the disadvantage of making the readings considerably in excess of those that would be obtained in an open location near the ground.

Many scales have been used,

especially among sailors, for stating roughly the force of the wind without reference to instrumental readings. One of these is found in Daniel Defoe's book "The Storm," published in 1704, the successive degrees of wind force being as follows: *Stark calm, calm weather, little wind, a fine breeze, a small gale, a fresh gale, a topsail gale, blows fresh, a hard gale of wind, a fret of wind, a storm, a tempest.* More than a century after the date of this book—viz., in 1805—Admiral Beaufort introduced the scale bearing his name, the degrees of which are based upon the speed of an old-fashioned frigate



or the amount of sail she could safely carry. This scale has since been modernized and is now known to sailors all over the world, besides being used to some extent on land. The Beaufort scale expresses the force of the wind in numbers, from 0 to 12, and also by a series of descriptive terms; viz.: *Calm, light air, slight breeze, gentle breeze, moderate breeze, fresh breeze, strong breeze, high wind, gale, strong gale, whole gale, storm, hurricane.*

The strongest wind hitherto measured with an anemometer was one of 186 miles an hour, recorded on Mount Washington, January 11, 1878. Much higher forces are undoubtedly attained in tornadoes. One of these violent "twisters," which occurred in Georgia, in March, 1875, was thought, from its effects, to have blown at the rate of 600 to 800 miles an hour!

The direction of the wind is observed by means of a device that, in its scientific forms, is generally called a *wind-vane,* and in its innumerable architectural forms a *weather-vane.* No other weather instrument except the rain-gauge has so long a recorded history. The Tower of the Winds, at Athens, built about a century before the Christian era, originally bore a vane at its summit. The vane is now missing, but on the walls of the octagonal tower may still be seen symbolical figures of the winds blowing from the eight principal points of the compass, together with their names according to one of the various systems of such names used by the ancients.

The winds in what the weather man calls the "air aloft" have always been a matter of much scientific interest, and in recent times have acquired fresh importance on account of their relation to aeronautics. They are observed chiefly by means of little free balloons, called *pilot-balloons,* the drift of which is sighted with theodolites, or by measurements of the movements of clouds.

The catalogue of winds is enormous; chiefly because, in a great many cases, winds of identical character and mode of origin have been given a multitude of names in different parts of the world. There are even cases in which a single wind bears different names in different parts of its course—after the fashion of London streets. Thus the *marin* of southern France becomes the *autan* after it crosses the mountains. While the scientific classification of winds ignores most of the local names, it is itself quite voluminous. Without undertaking to enumerate all the winds recognized in current textbooks, let us mention just enough of them to illustrate the great diversity of the population ruled over by Aeolus.

WIND IS A FACTOR IN GUNNERY

Aiming must be based on elaborate calculations of the effect of the wind on projectiles.

The *trade winds* do more than carry the westbound mariner on his way. They have been called "the pulse of the atmospheric circulation," because their fluctuations are related to the weather events of distant regions, and their parching breath is responsible for most of the world's big deserts. The great swirls of air called *cyclones* are the most furious storms of the tropics, while in temperate latitudes they are responsible for kaleidoscopic changes of weather, but are by no means always stormy. Both cyclones and their antitheses *anticyclones* are in some cases more or less fixed in location, through a

PHOTO U. S. FOREST SERVICE

THE CURSE OF THE DRIFTING SANDS

At low water the wind tosses the sand of the river bottom over the fields of the farmers in the Columbia River Valley, Oregon.

season or the year, and play a conspicuous rôle as "atmospheric centers of action." Cyclones and anticyclones, known also as *lows* and *highs,* are the most important things in life for the weather forecaster. One expert out in Australia, the late Clement Wragge, went so far as to give a personal name to every one of these disturbances that appeared on the local weather map, and he paid off grudges by naming the nastiest storms after his enemies. In the middle latitudes of both hemispheres there is a prevailing drift of the atmosphere from west to east, but it is so much diversified, especially near the earth's surface, by temporary disturbances that it is sometimes difficult for the inhabitants of these regions, including the people of the United States, to realize that they live under the dominance of the "westerlies." Temperature contrasts between land and sea produce the vast seasonal *monsoons* and the local daily *land and sea breezes.* Some winds are due to non-atmospheric causes. Thus violent blasts of air are produced by landslides, forest fires and big explosions, and the strongest winds on earth, tornadoes excepted, are manufactured at will in the "wind-tunnel" experiments of laboratories.

Winds have many momentous consequences besides blowing your hat downstreet. They carry the climate of the ocean to the land, and of the land to the ocean. They transport solid material in enormous quantities from one part of the earth to another. Farmers must often fight them, with windbreaks and other expedients, lest their fields be buried in drifting sands and their crops suffer the parching effects of "wind-burn."

In the temperate zones winter is, in general, windier than summer, on account of the greater contrasts of temperature that prevail in the cold season between higher and lower latitudes. This effect lags in some regions into the early spring.

The Deer of the Kaibab

By T. GILBERT PEARSON, LL. D.

President, National Association of Audubon Societies

EL TOVAR is the usual objective of visitors to the Grand Canyon of Arizona. Standing on the brink of this mighty chasm, one's eye may come to rest on the clear-cut outline of the north rim, thirteen miles away as the eagle flies, but two days hard journey for a man on horseback. That rim upon which so many thousands have gazed and on which so few thousands have trod is near the southern boundary of one of our most famous National Forests, known far and wide as the Kaibab. On a plateau some twenty-five by forty miles in extent, eight to nine thousand feet in elevation, its woodland is mostly open and park-like growths of yellow pine, spruce and white fir. On the east and west are deserts, and on the north the sagebrush lands and the hopeless barren hills stretch away and away one hundred and seventy miles to the nearest railway.

To this region a group of conservationists journeyed in August, 1924, and for ten days studied its fascinating secrets. Long rides were made in beautiful romantic woodlands, down crumbling canyon walls, through almost impassable growths of scrub oak and into small open valleys girt with quaking aspen and destitute of water. At night they lay in their sleeping bags while the coyotes howled, and the ice formed in cooking vessels and the stars twinkled and snapped in the sharp, crisp atmosphere above. This was not a pleasure party. It was business, and very serious business at that. They had come at the request of the late Henry C. Wallace, United States Secretary of Agriculture, who had asked assistance in solving a problem.

Let us go back to February, 1893, when by Presidential Proclamation this territory was established as the Grand Canyon Forest Reserve. For many years prior to this it had been unrestricted lands where the Mormons had grazed horses, sheep and cattle and where hunters came in autumn to get their supply of venison. The mule deer, one of the three species of deer common in the United States, had long been abundant here, and the plateau is still known to local people as Buckskin Mountain. Some time after the Kaibab was made a National Forest, an act of Congress of 1906 created the Grand Canyon National Game Preserve, the boundaries of which followed rather closely the lines formerly set for the National Forest.

To the Forest Service of the Department of Agriculture fell the responsibility of administering the reserve. The service took stock of the livestock on the territory, then about 24,000, and, following lines of general forest management, issued permits for the numbers of stock of various kinds that permit-holders should be allowed to graze here, the object being to restrict the domestic animals to the proper number the range could carry.

Government agents, especially those of the Biological Survey, began a systematic campaign to destroy those predatory animals which prey upon grown deer or their young. Pumas are especially destructive to game of this type and, where present in a deer country, they are generally credited with killing on an average of one deer each a week. Private

HUNGRILY BROWSING ASPEN

Bucks ate off the lower branches as high as they could reach.

PUMAS KILL ONE DEER A WEEK

Concerted activity virtually wiped out this enemy of the deer on the Kaibab, thus protecting them.

hunting parties in quest of the Puma or "Mountain Lion" were also welcomed into the region. These combined agencies up to 1923 are reported to have destroyed in the Kaibab region the following predatory animals: mountain lions, 672; coyotes, 3,000; wildcats, 120; and wolves, 11.

The restriction against hunting deer has, of course, been enforced rigidly. Under such conditions of no hunting and their natural enemies rapidly lessening, the deer of the Kaibab entered upon a period of great prosperity, and it seemed to many people that their future happiness was secure for all time. But the very causes which made for the increase of the deer herd in time began to threaten its very existence. A few years ago word began to reach Col. William B. Greeley, Chief Forester, that the deer of the Kaibab were becoming too numerous for the food supply, which in that semi-arid climate at no time is as abundant as one finds in any typical deer country of the eastern states. Colonel Greeley at once ordered an investigation of the conditions, and his experts reported that the range was being rapidly depleted and ill fortune therefore was threatening the herd. How was this remarkable situation to be met? How was such an unheard-of case of over-conservation of wild life to be handled? Many said that the only sensible thing to do was to remove some of the deer in order that the herd might be saved. Others, doing justice at least to a certain tenderness of heart, cried out that none of those beautiful creatures should be destroyed, and even expressed disbelief of the statements of conditions as reported by the government experts. Accordingly the Secretary of Agriculture asked certain well-known organizations interested in conservational and recreational problems to appoint representatives who would investigate for the general public good. The following committee undertook this work: John B. Burnham, chairman, representing the American Game Protective Association; Heyward Cutting, of the Boone and Crockett Club; T. W. Tomlinson, secretary of the American National Livestock Association; and the writer, representing the National Association of Audubon Societies and the National Parks Association.

Immediately upon entering the Grand Canyon National Game Preserve all members of the committee were much impressed by the great abundance of deer. An average of one hundred a day were seen as we rode in a body through the forest, despite the fact that we were much abroad during the warmer hours of the day when deer generally seek retirement in secluded places. The region of greatest concentration seemed to be in the neighborhood of V. T. Park. In the evening deer appear here in large numbers and throughout the night graze principally on the wild clover now scarcely half an inch high of very scanty growth. In an automobile ride of twenty miles taken between six and seven on the evening of August 21, I counted 1,028 deer, and Major Goldman, and Mr. Richard T. Evans of the United States Geological Survey, who accompanied me, reported even larger numbers. This count was made along the road between the rim of the canyon and the north end of V. T. Park.

Of perhaps more than two thousand deer seen in the Kaibab by our committee the vast majority were in very poor condition, the outline of the ribs being plainly observed in most cases where the animals were close enough for careful inspection. And this, remember, was at a time of year when the deer should have been in good condition, for in August and September they should be laying on fat against the winter to come.

Mule deer are browsers, rarely grazing, except in a casual sort of way. Their natural summer browse in the Kaibab consists in considerable part of leaves and tender twigs of quaking aspen, snow-berry and

DOE AND HER TWO FAWNS

All young trees in the Kaibab for some time past have been bitten off as they appear above ground.

dwarf ceanothus. Over great portions of the forest the aspen was completely browsed as high from the ground as a buck can reach standing on his hind legs, and there were no young aspen trees in these regions under several years of age. All young trees are, and for some time past have been, bitten off as soon as they appear above the ground. We cut down some aspens one evening and the next morning found two does and their fawns in open view within a hundred yards of camp eagerly eating the last of the aspen leaves. The snow-berry has become almost totally destroyed over large areas, and the limited growth of ceanothus is fast disappearing in many sections.

The cliff rose or "buck bush" naturally grows in some abundance in many places on the lower reaches of the Preserve, where the deer go when the snows drive them from the higher altitudes. Much of this has been destroyed through over-browsing, and many of the larger bushes have been broken down by animals in their frantic efforts to get at the leaves.

White fir is eaten to some extent by deer in winter, but in August we found them feeding upon it extensively. They were even eating leaves of scrub oak. The summer range generally was so overbrowsed that large numbers of deer at the time of our investigation had already entered their winter range and were living on their winter supply.

The deplorable conditions of the range, oddly enough, do not exist in every part of the Game Preserve. Near the northern end for example there is considerable food left, but for some reason the deer do not frequent this section in such numbers as we found elsewhere. The same was true of places immediately south of the Game Preserve in the Grand Canyon National Park, particularly on Greenland Plateau. The inherited habit of drifting principally through certain favorite regions would appear to be a possible explanation as to why the animals do not distribute themselves evenly throughout the whole forest. Even if they could be induced to take such a course, which does not seem possible, it would probably result only in delaying for a short time the ultimate destruction of the range if nothing is done to check the constant increase of the herd.

In September the committee submitted to the Forest Service in Washington a detailed report of conditions as it found them in the Game Preserve. We recommended first that the Government give deer away for stocking purposes at the cost of capturing and crating. If this should prove inadequate, the committee recommended the permitting of limited hunting under strict supervision, a practice long employed with success in some of the European countries.

As the cattle ranging in the Preserve, although essentially grazers and not browsers, are now competing for food to some extent with the deer, we advised that the 3,000 in the Kaibab at the present time be reduced, if possible.

Along the line of the committee's advice the Forest Service is now advertising to give mule deer for propagation to those who want them at $35 each to cover the cost of capture and crating.

Coconut, Citizen of the Tropics

By OTTO WILSON

WHAT picture of the Tropics would be complete without the spreading fronds of a coconut tree silhouetted against the sky? When an artist wants to suggest the heat and languor of endless summer his first thought is to sketch into his picture a group of the tall palms, knowing very well that they will at once bring to everyone's mind the idea of sun-drenched lands. It is indeed quite appropriate that the coconut should be the symbol of the Tropics since it grows nowhere else and is generally distributed over the winterless areas of the earth. For ages it has provided the swarming natives of the Pacific islands with food, drink, shelter, and most of their other needs. Now it has extended its benefactions to the races of the temperate zone, giving them fats for cooking and eating, soap to keep them clean, and a delightful confection to satisfy their craving for sweets. The coconut would stand high on a list of trees most useful to mankind.

While this most famous of all the palm trees is at home everywhere in the Tropics, in order to see it in all its glory of riotous profusion we would have to explore the southern coast of Asia and the multitudinous islands of the Pacific. There it fringes thousands of miles of sandy coast lines, pouring forth literally billions of nuts each year. Ceylon, just off the coast of southern India, has best claim to the title of coconut capital of the world. Its cultivated plantations line the coast for hundreds of miles, and upon its soil there rains a perpetual shower of millions of nuts daily. That one island alone has been officially credited with 850 million nuts in a year, and unofficial estimates have put the number as high as two billion and more. The nearby Malabar coast of India is also famous for its millions of trees, and the Philippines, especially in late years since new plantations have been coming into bearing, rank as one of the chief producing areas.

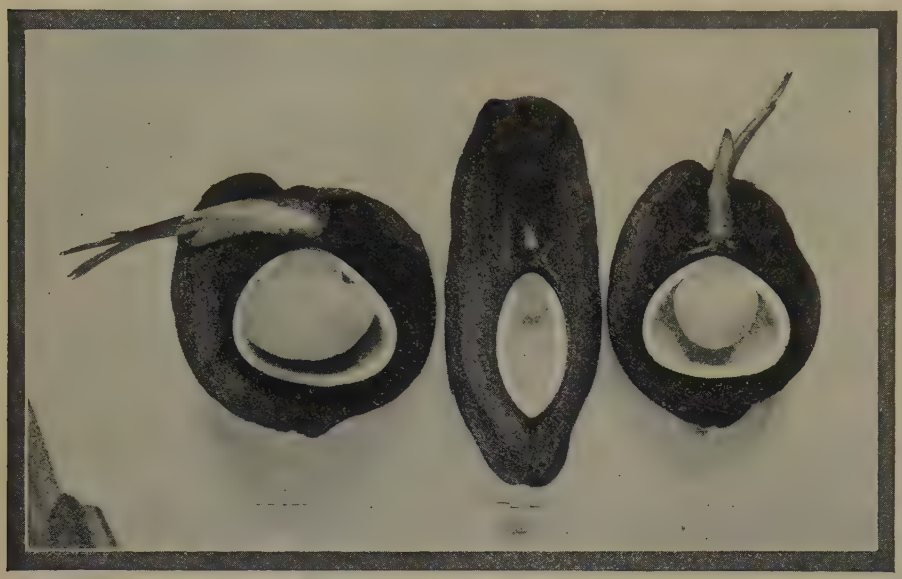
On this side of the world the yearly crop is comparatively small, forming only some 2 or 3 per cent of the world's total. Panama, Trinidad, Jamaica, and some islands off the eastern coast of Central America are the chief growers of coconuts in the western hemisphere, and from them the United States gets its whole supply of nuts imported "in the shell." All told, it is said that the Tropics contain some 240 million coconut trees, which bear an annual crop of seven to eight billion nuts.

The origin and history of this prolific friend to man are for the most part wrapped in the darkness of antiquity. For a long while it was commonly accepted that coconut trees spread from one land to another through the action

MAIN STREET IN COCONUT LAND

An avenue of palms in Florida—about as far north as the trees grow.

of ocean currents in carrying the nuts which dropped into the water from seaside trees. The thick husk that encloses the ripe nut makes an admirable float, and coconuts have many times been washed up on coasts hundreds of miles from any parent trees. One was picked up on the coast of northern Scotland, and the milk in it was found to be still sweet and palatable.



THE COCONUT WITHIN

Split nuts showing kernels, white luscious lining and outer fibrous coverings.

However, the idea that coconut trees have spread to new lands in this manner is questioned by Dr. O. F. Cook, the authority on tropical agriculture of the U. S. Department of Agriculture. He asserts positively that coconut trees do not grow wild naturally, and that they are to be found only in regions where they have been planted by human hands. If so, they must have been taken from island to island in the Pacific by natives, and through the same agency must have spanned the thousands of miles between the lands of the east and tropical America. He considers it probable that the first home of the coconut tree was in the interior of Colombia, in northern South America. From there it reached the seacoast and spread to the east and west coasts of Central America and the islands of the Caribbean. Then, perhaps by a bridge of islands that have since disappeared, perhaps in the sailing canoe of some wild Columbus among the aborigines of ages ago, its human cultivators carried it to its Indian and South Pacific home.

Whatever the facts may be, it is certain that the coconuts of commerce come almost entirely from plantations. In recent times coconut planting has been made into a science. The trees are set out from nurseries in which the nuts are germinated, planted some twenty feet apart, protected as much as necessary from the sun, defended from weeds and insect pests, and, on the best plantations, fostered as carefully as a modern farmer looks after his crop of grain. They begin to bear when about seven years old, yielding sixty to one hundred nuts or more a year for each tree. If spared by hurricanes, beetles, and other natural enemies, they are good for the three-score years and ten of a human lifetime, or longer. All they ask is plenty of salt in the air or the ground, or at least an alkali soil, and floods of intense golden sunshine. The islands and coast lines of the tropical east meet these conditions ideally, and there are at hand also lands costing little or nothing and bountiful supplies of native labor, which, though uncivilized, is adequate for handling the trees and copra when properly controlled. Often a certain amount of danger is involved, but in the eyes of many restless young white men this is an attraction rather than a drawback. This double lure of adventure and handsome profits has brought many a high-spirited youth from civilization to these ends of the earth to transform jungle and coral island into gar-

THREE VARIETIES OF COCONUTS, UNHUSKED

The San Blas nut of Panama in the center is considered by some the best of all.

den spots. The life history of the coconut begins in a big family cluster of brothers and sisters nestling among the curving fronds at the top of the tree. The nuts on a single tree may at one time represent all stages of growth and ripening. As the growing coconut expands and matures in the hot sunshine, three well-beaten paths of usefulness to man open out before it. When it is full grown but still unripe, a native boy may come climbing up the smooth trunk, hack off the stem with his machete, and slip down with it to the ground for the sake of the watery liquid it contains. At this stage the newcomer to the Tropics will look in vain for anything resembling the brown monkey-faced nut with which he is familiar. Instead he will see a three-sided greenish object ten or twelve inches through, somewhat resembling a smooth pumpkin.

When the boy cuts off a small section with a dextrous slash of his knife, a hole about the size of a silver dollar appears, showing a hollow cavity inside, whose walls are made up of an inch or two of greenish-white, fibrous-looking meat, probably coated on the inside with a thin layer of a glistening jelly-like substance. When the visitor has had his fill of the cool refreshing drink, the green container is thrown away and the life history of that particular coconut is over.

If the nut is allowed to remain in the tree, the jelly-like substance will be gradually absorbed into the water, giving it the color and consistency of milk, and the solid meat of the walls will separate out into four distinct layers. On the inside will be the white meat with which we are all familiar, and around it will form the dense, hard shell. The fibers embedded in the flesh of the green coconut will draw off to form a loose outer layer which will act as an excellent shock absorber for the seed-nut within when the time comes for the long drop to the ground. Enclosing the whole will be a woody hull, formed from the green skin of the unripe nut. When it is finally ripe the nut will loosen its hold on the stem and fall to the ground, there to be gathered up by a native and carried with hundreds of others to the husking ground.

SYMBOL OF ENDLESS SUMMER

Coconuts grouped in the upper branches of a Costa Rican palm.

From this point the two chief pathways of service for the coconut diverge. Its destiny may lead it to the confectioner or the baker on the one hand, or, on the other, it may be headed for the vat of the manufacturer of cooking fats, oleomargarine, or toilet soaps. If the former, a native will shear off the husk by driving it down on a sharp stick or plow point set into the ground, and it will be thrown into a jute sack and loaded on to the next outgoing steamer for a North American or European port. If the latter, the native will split it open, either husked or unhusked, by a sharp blow

from his big knife, and it will be dried for a day or two in the sun or in a special drying house, or smoked over an open fire, until the meat curls away from the shell, from which it can be easily picked off. This is the well-known "copra" of commerce, which, without further preparation, is ready for the oil presses.

By far the greater amount of all coconuts raised every year go into copra and are pressed for oil. In the last thirty or forty years there has been an insistent demand from the civilized world for more vegetable fats. In this country cottonseed oil has partly satisfied the demand, but Europe has found in the coconut oil almost an ideal answer to its requirements. Our own special interest in coconut oil may be said to date from the late war. In 1917 it became the leading raw material for soap making in this country, and in the following year, when imports took a tremendous leap upward, we used more coconut oil for making butter substitutes than we did cottonseed oil. In 1919 we drew nearly 350 million pounds of this new favorite from the tropical plantations. Since then there has been a falling off, but we still buy tens of millions of dollars' worth of oil and copra together every year and make them up into cooking and eating fats, which take the place in our households formerly occupied entirely by lard and butter. Most of our copra and oil comes from the Philippines.

FROM PLANTATION TO MARKET

Some coconuts are shipped as gathered, others made into copra by natives.

When it is pressed out of the copra, the better grades of coconut oil, after going through a refining process, are sold to the makers of oleomargarine and vegetable cooking fats and in one form or another find their way to our din-

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NUTS FOR COPRA IN THE PHILIPPINES

This is an important industry in the Islands, the dried kernels being used to make coconut oil, the base of soap and candles.

ner tables. The poorer grades are made into soap, although some makers of especially fine toilet soaps use the best grade of oil they can get. For making liquid soaps coconut oil has admirable properties and, when properly used, produces a soap that is clear, transparent, and sparkling.

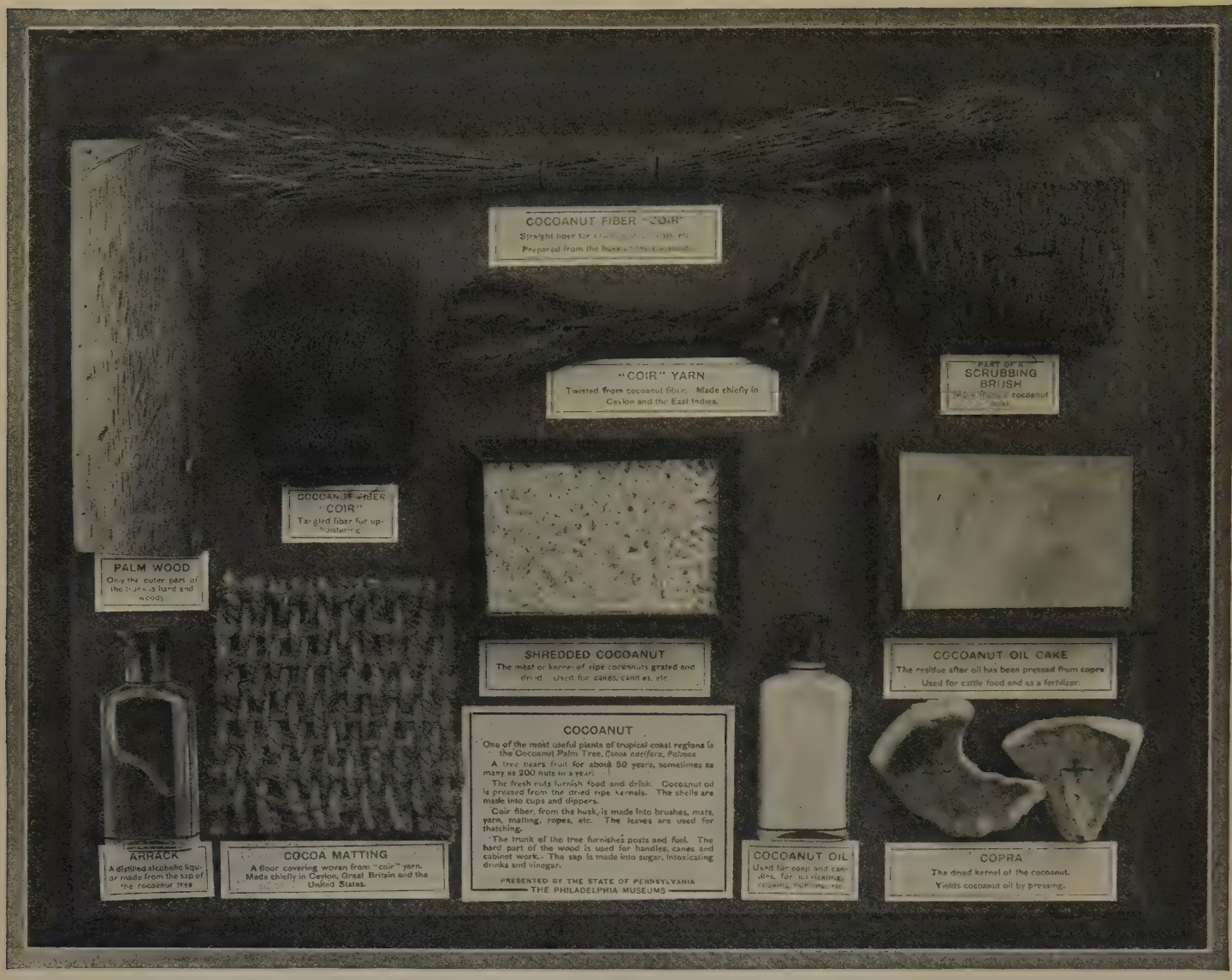
More appealing to our sugar-loving American palate is the other great use to which coconuts are put. Few of us but can remember how attractive to our boyhood or girlhood eyes was the big cake in the center of the table, covered with white icing and ragged with coconut shreds. Such cakes, together with candies and other confections, still make up the chief destination for nine-tenths of the whole coconuts brought into this country. The rest are sold to the public to be eaten as they are. The largest part of our shredded coconut is made in this country, but a good deal is imported, mostly from Ceylon.

Coconuts and their products are, year by year, becoming more useful to Europe and America. But it is the native of the coconut countries who really knows what the nut and its tree have to offer to humanity. In many places it is one of his chief food resources. The water of the green coconuts is, of course, a universal drink wherever the tall palm grows, and it also supplies a stronger beverage on demand. This sap can also be boiled down to produce sugar. In young trees the central part of the stem can be eaten, and the young buds from the top of the tree make a toothsome vegetable called "palm cabbage." In Mexico the dried cotyledons of the germinated nut are marketed as "coconut apples" and are said to be delicious. Empty shells come in very handy for table utensils and a score of other uses. The long leaves of the coconut tree are used for thatching and are plaited together to make mats and baskets. Their stems can be made into oars and used for fencing and the fiber in old stems for making ropes.

NATIVE COCONUT OIL FACTORY IN THE PHILIPPINES
Growing the nuts and manufacturing them is an important industry.

OPENING COCONUTS FOR DRYING
Before the valuable copra is made the opened nuts must be well dried.

The wood, known as "porcupine wood," furnishes material for cabinet making as well as building and finishing. From the husk the coarse fibers have a wide range of uses and now make up an important item of commerce. "Coir" mats, brushes, and floor coverings are common, and florists find the material especially useful for packing plants when it is necessary to keep them moist. The dried flower-stalk is sometimes used for torches, and natives occasionally chew the root of the tree, which has narcotic properties. In some nuts a small bluish-white substance is found, called "calapite" or "calappa," which Malays and Chinese often wear as


COCOANUT FIBER "COIR"
"COIR" YARN
Twisted from cocoanut fiber. Made chiefly in Ceylon and the East Indies.
SCRUBBING BRUSH
COCOANUT FIBER "COIR"
PALM WOOD
Only the outer part of the trunk is hard and wood.
SHREDDED COCOANUT
The meat or kernel of ripe cocoanuts grated and dried. Used for cakes, candies, etc.
COCOANUT OIL CAKE
The residue after oil has been pressed from copra. Used for cattle food and as a fertilizer.
COCOANUT
One of the most useful plants of tropical coast regions is the Cocoanut Palm Tree, Cocos nucifera, Palmae
A tree bears fruit for about 50 years, sometimes as many as 200 nuts in a year.
The fresh nuts furnish food and drink. Cocoanut oil is pressed from the dried ripe kernels. The shells are made into cups and dippers.
Coir fiber, from the husk, is made into brushes, mats, yarn, matting, ropes, etc. The leaves are used for thatching.
The trunk of the tree furnishes posts and fuel. The hard part of the wood is used for handles, canes and cabinet work. The sap is made into sugar, intoxicating drinks and vinegar.
PRESENTED BY THE STATE OF PENNSYLVANIA
THE PHILADELPHIA MUSEUMS
ARRACK
A distilled alcoholic liquor made from the sap of the cocoanut tree
COCOA MATTING
A floor covering woven from "coir" yarn. Made chiefly in Ceylon, Great Britain and the United States.
COCOANUT OIL
COPRA
The dried kernel of the cocoanut. Yields cocoanut oil by pressing.

ALL IN THE LIFE OF A COCONUT

Some of the service given man by the coconut palm, not the least of which is to protect him against poison gas in war.

an amulet, believing that it has mystic healing powers.

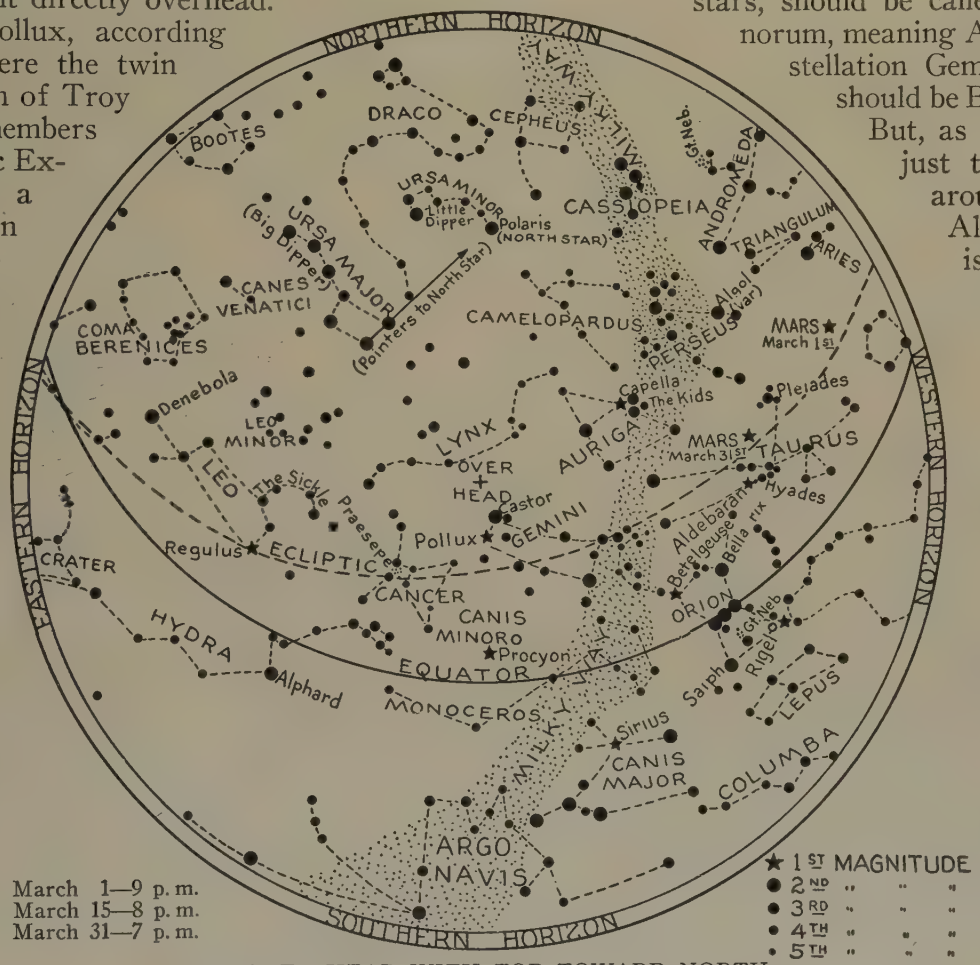
The list of important uses of the coconut would not be complete without mentioning one of its latest-found virtues, which brings it to the front in modern warfare as well as the usages of peace. When the Germans sent over their first clouds of chlorine gas at Ypres there was an immediate rush on the part of the Allies to get any kind of effective gas mask. The first crude improvised articles were gradually improved upon, and when the United States entered the war its army chemists made a systematic search for the best gas-absorbing materials that could be found. After a long series of careful tests it was found that the charcoal produced when coconut shell was burned in a retort stood in a class by itself for this purpose, being approached only by the shell of some related palm nuts. Immediately the procurement of this shell was organized and agents sent to the Philippines, the Malay Peninsula, and the Caribbean to get all they could of it. They sent in several hundred tons, and if the war had lasted another year American gas masks would probably have been supplied with coconut-shell charcoal exclusively. If another great war comes, even the billions of nuts which the Tropics now furnish will be far too little for supplying this all-important safeguard to our armies and civilians.

The Evening Skies in March

By ISABEL M. LEWIS

"BY GEMINI," sailors of ancient days were wont to say as they called upon the constellation of that name to aid them in surviving turbulent seas. Thus they gave us our expression "By Jiminy" of today, which really has reference to a heavenly body that this month is very close to the zenith point directly overhead.

Castor and Pollux, according to mythology, were the twin brothers of Helen of Troy and they were members of the Argonautic Expedition. When a storm came up on the return voyage and the ship was nearly wrecked, Apollo is said to have caused two stars to appear on the heads of Castor and Pollux and the storm abated. Seamen, therefore, have always considered these stars as special deities and, since they appear in the constellation Gemini, called upon the whole group in time of danger. Gemini is also the constellation in which the sun will be found each year at the beginning of summer. It is, as well, a zodiacal constellation as it lies along the ecliptic or yearly path of the sun through the heavens.



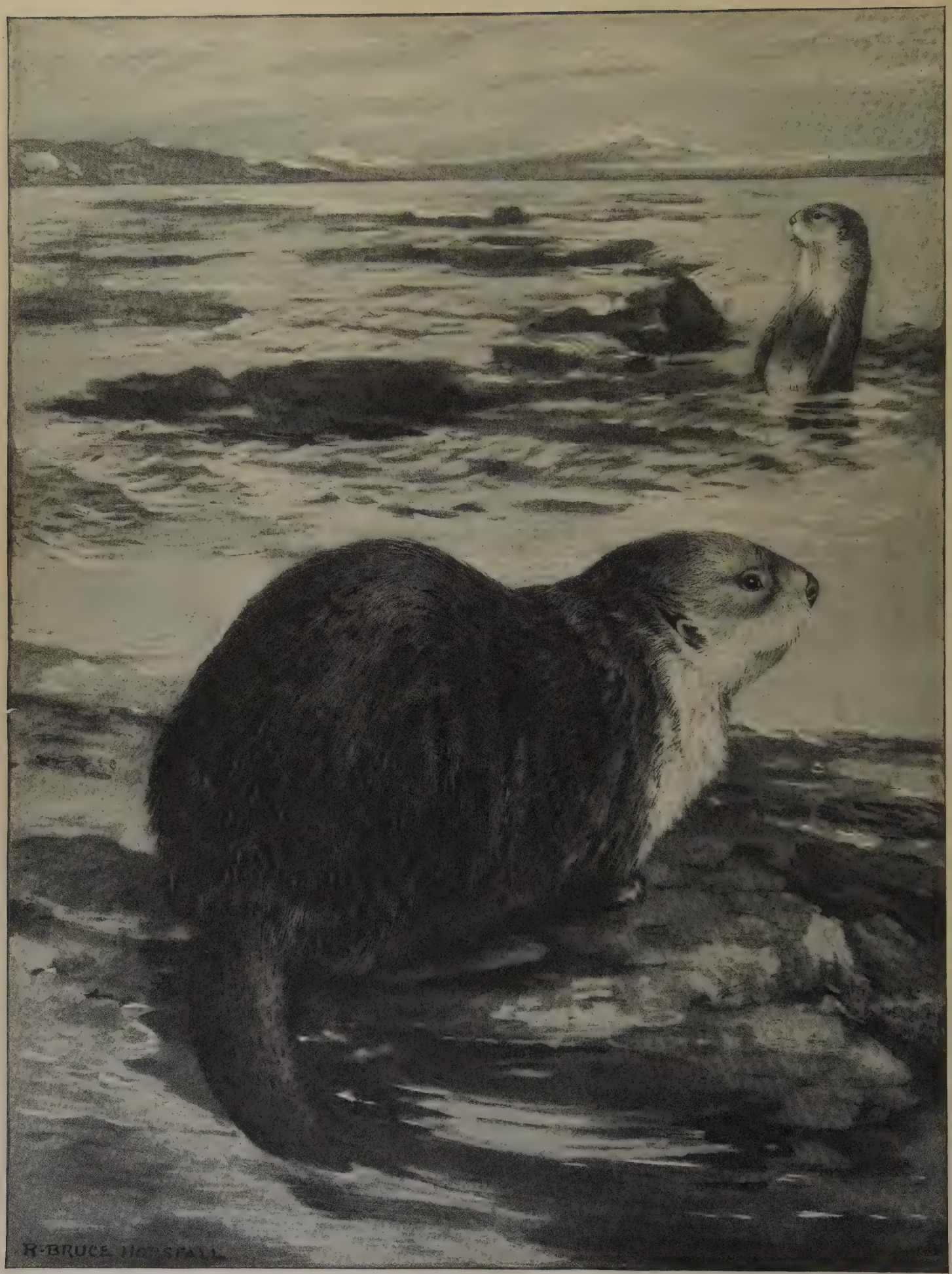
HOLD OVER HEAD WITH TOP TOWARD NORTH

The Twins will be easily recognized by its two brightest stars—Castor and Pollux. They lie about as far apart as The Pointers of the Big Dipper, now visible over in the northeast. Pollux is on the meridian due south at this time. Though it is now brighter than Castor it is probable that at one time Castor was the brighter of the two stars. It was the custom of the ancient astronomers to name the brightest star in a constellation Alpha, the first letter in the Greek alphabet; the second brightest star Beta; the third brightest Gamma, and so on in the order of the letters in the alphabet. According to this plan Pollux, the brighter of the two stars, should be called Alpha Geminorum, meaning Alpha of the constellation Gemini, and Castor should be Beta Geminorum. But, as it happens, it is just the other way around. Castor is Alpha, and Pollux is Beta. So the astronomers suspect that when these stars received their names, many centuries ago, Castor was as bright as, if not brighter than, Pollux.

Though now less brilliant than Pollux, Castor is the more interesting star because with a small telescope it will be seen separated into two stars and the spectroscope tells us that each of these two stars is also made up of two stars too close together to be separated even with powerful telescopes. So where we see but one star with our unaided eyes we know there are four stars closely associated.

Next to Gemini on the east is Cancer, The Crab, a very inconspicuous and uninteresting constellation, as a whole, but, like Gemini, one of the zodiacal groups. In Cancer there is a coarse cluster of stars known as Praesepe, The Bee-hive, which can be seen as a faint luminous cloud even with the naked eye on a clear night when there is no moon-

(Continued on page 184)



THE MYSTERIOUS SEA OTTER

The Mysterious Sea Otter

By HAROLD MCCRACKEN

AS GOLD was to the pioneering and development of California and the Yukon, so was the mysterious sea otter to western Alaska. While some of the Russians adventured their way eastward from the Siberia of those days in much the same spirit as Christopher Columbus set out on his historic voyage, yet back of it all was the greed for furs, and of these the pelt of the sea otter was the prize. The hardships and adventures which Columbus encountered were like a Sunday afternoon boating trip on Long Island Sound compared to what those explorer-adventurers of the North Pacific endured.

The sea otter had much to do with those first voyages, and the rich brown white-specked pelts of those same animals were, like the gold to California and the Klondike, the basic reason for the Russians establishing themselves and their church on Alaskan shores. Perhaps, had it not been for the sea otter, Alaska would never have become a possession of the United States; for the Russians might not have made a permanent settlement of the district and the territory would then have become a British possession along with what is now Canada.

The sea otter, once so abundant and now so rare, is today regarded as something of a myth by most people; and there are now but few individuals to any extent familiar with the details of its life history. As its hunting has been strictly prohibited by law for the past several years, even the old-time native hunters have about forgotten its habits, and they are quite unknown to the younger generation.

Living as they do a lonely life around the broken reefs and kelp patches of the stormiest and most uninviting sections of the far north Pacific coast, where even in the calmest weather it is dangerous for almost any other than a native boat to venture, these animals are but seldom seen by human eyes—except those of poachers who each year take a few pelts that are eventually smuggled into the States and sold for a fancy price.

The sea otter was originally abundantly distributed over almost the entire coastline of the North Pacific, on both the American and Asiatic sides north of about the fortieth parallel. In 1751, when this animal was first scientifically described by Steller, its pelt was commonly used as an article of clothing by the natives. Then came the period of intensive hunting, until today the species is closer to the brink of extinction than any of the other fur bearers, and its distribution is restricted to but a few of the most secluded spots along the southwestern coast of the Alaska Peninsula and the Aleutian Islands, and in a few sections along the Siberian coast.

During two seasons of knocking about in small boats in sections where these animals are supposed to be most plentiful, and ever on the lookout for them, I have on but a single occasion actually seen a sea otter in its native habitat. This was while passing through the Isanotski Straits at the extreme western end of the Alaska Peninsula, in the summer of 1922. He was a full-grown animal and was playing near the edge of a large kelp patch. Immediately upon seeing the otter we shut off the motor of our boat and watched him through our binoculars. Then, when we tried to approach to get a closer view, he disappeared, and, though we spent several hours trying to locate him again, it was the first and last sight I had of a live sea otter at home.

Five years previously I spent the entire fall and winter traveling with a fur trader in a small schooner, visiting practically

OCCASIONALLY PELTS ARE TAKEN

The law forbids sea otter shooting, but there are always poachers and smugglers.

every island and small bay in that whole section, without seeing a single sea otter; and I know of many men who have lived for several years in those same parts and never got a glimpse of one.

THE BIDARKA, THE NATIVE SKIN CANOE

From this tipsy craft the hunters speared the sea otter in the days of its abundance.

But during the two rather lengthy sojourns which I have made in that particular part of Alaska, I have spent considerable time in and around the Russian-Aleut village of Belkofski, which place was at one time center of the great sea otter hunting industry. On most of my trips while there I employed these old-time sea otter hunters as guides and packers, and they were my neighbors and companions during the winter of 1916–17. It is from these weather-beaten old men, who once supplied the Russian priests with the precious rich brown pelts, that I gleaned the information which I have of the sea otters.

In the days before the advent of the American traders on the coast of Alaska, virtually the entire catch of sea otter pelts went through the hands of the Russian priests. These pelts were very highly prized in Russia, where they occupied quite the same distinction as has the ermine in some of the European courts. They were the regal fur. Even in more recent times a requirement of the Russian gentleman was that he wear a sea otter cap. It also seems that the fur of this animal was especially adaptable to a gilt or golden dye with which it was colored and in which form it was largely used as a decoration for court garments and robes.

Alaska in the sea otter days was ruled by the Russian priests. The natives paid for everything with pelts. Large numbers of the otter skins were turned over to the priests for the privilege of having churches erected in their villages; for the religious prints imported from Russia to hang on the walls; the gold and silver ikons, church robes and other decorations; for marriages, christenings and other duties which the priests performed.

These ecclesiasticals even went so far as to instigate what was termed an "Easter hunt," which was a week in duration and at which time all of the sea otter skins that were taken were turned over to the church. And, according to the number of pelts a native hunter brought in on this hunt, so would he be blessed for the rest of the season.

The sea otter, in general appearance, has a cylindrical body somewhat resembling the common seal. The animal is from three to four feet in length, including an eight- to ten-inch tail, and weighs from 80 to 110 pounds. The hind part of the body ends abruptly in the flat oar-like feet, which are greatly like the flappers of the seal; the fore part of the body tapers directly to the

NATIVES DRESSED FOR THE SEAS

The forebears of these men knew the days when the sea otter was an item of Alaska's wealth.

blunt head, without any noticeable neck, while the forefeet are very small. Their rather small eyes are set high in the head, and the ears are unusually low down. They have short stiff whiskers resembling those of the seal. The skin is very loose upon the body, and the fur is generally of a deep liver-brown color, frosted with a scanty growth of long, silver-tipped stiffer hairs and underlain by a preponderance

AN ALMOST PRICELESS FUR

The skins of the sea otter made the regal robes of old Russia.

of beautiful soft woolly fur which gives the pelt its value. The animals feed on mussels, sea-urchins, crabs, and perhaps the tender shoots of kelp.

The sea otter spends practically its entire existence in the water. During the spring and summer months, when the weather is calm, they go from fifty to one hundred miles out to sea. It is usually at this period that the young are born, the mother merely resorting to some kelp patch or possibly the jutting of a rocky reef for the purpose.

Usually but one young is born, and while the pup comes into the world with acute senses, sharp teeth and an ample amount of vitality, he matures but slowly and cannot live without the care and constant watchfulness of his mother.

Probably few animals show quite as much interest and affection for its offspring as the mother sea otter. She seems to take the greatest delight in fondling, playing with and caring for her youngster. For hours at a time she will lie on her back in the water with her pup clasped between her forefeet and "sing" to it with a crooning sound somewhat like the purring of a cat and caress it; and it is usually in this same position that she sleeps. This playfulness, however, is not entirely restricted to mother and young, for it is common for a mature animal to lie on its back in the water and, "singing," play alone with bits of kelp or sea weed, which it will toss about from paw to paw, seemingly delighting to catch the pieces before they strike the water.

The sea otter takes several years to grow to maturity; and this and the fact that the females have but one pup a year, to a large extent explains

IN CARNIVAL ATTIRE

Native adornment in Alaska has little to explain it.

the quickness with which these animals became so nearly exterminated as a species under the intensive hunting to which they were subjected. Another factor which was detrimental to the welfare of these creatures was the fact that their pelts are "prime" at all seasons of the year, and they could

be profitably hunted at any time.

The natives employed several methods in taking the sea otters; but the most generally used method was that of hunting them at sea in the *bidarka* or skin canoe. This was usually during the spring or summer months when the weather was calm. A fleet of the little skin boats would set out together. When likely hunting grounds were reached the flotilla would spread out in open formation and move forward until an otter was sighted. Then the grand chase took place. The animals were generally found singly, though occasionally they would travel in small groups. The object was to tire the animal out by causing it to dive again immediately it came to the surface for air. Eventually the line of canoes would form a circle around the otter and slowly close in upon it. When it at last came up inside the concentrated circle every native hunter that was close enough would hurl his spear or harpoon at it. Sometimes the animal would be struck by several spears; but the one which lodged nearest to the head always secured the prize.

RUSSIAN CHURCH BUILT WITH SEA OTTER SKINS

The more pelts the natives gave the priests the more beautiful their religious edifices.

In later years, after sea otter hunting became a more highly commercialized occupation, the fleets of skin canoes were taken out to the hunting grounds on the decks of large sailing vessels, on which the natives could live and thus make possible their spending longer periods before returning to their villages; though the method of hunting and capture remained the same.

The season's catch of one of these vessels in about 1794 would be about two thousand to as high as five thousand sea otter skins, while about 1895 a season's catch might be as low as fifty pelts. And today one might spend an entire season hunting over the very best sea otter country and not so much as see a single one of the animals. Nevertheless, a few skins are taken by poachers every year.

In the winter and during the very stormy periods the sea otters would come in close to the coast to seek shelter behind the protection of small islands or inside large reefs. At such times the natives resorted to several methods of capturing them.

During heavy storms a vigil was kept along the shore and at places out among the islands where the sea otters might come in for shelter. Occasionally the animals crawled on a sandy beach or jutting rock to lie and rest and in such places were sometimes very easily killed.

A native hunter was generally located at the entrance to each little cove and shelter, with his *bidarka* pulled up among the rocks, watching and waiting for an otter to come in. As soon as the animal got well into the place the skin canoe would be slipped into the water and paddled swiftly out after the prize. And it was seldom that the animal escaped the skilled hunter in the little craft.

Sometimes the otters were speared (that is, until the rifle was brought into general use) from the point of a cape or from a rock in the center of the entrance to these little bays. Sometimes large nets were set in places where the otters would dive into them, become entangled, and either drown or be held until the hunters could get out to kill them. These nets were always buoyed up, because if the animals were drowned and sank to the bottom the sand fleas were likely to ruin the pelt before the hunters recovered them.

But gone are those glorious days of the sea otter hunts, and faded is the rule of the Russian priests on that stormy Alaskan coast. Like the buffalo and the antelope of the plains, they could not resist man's intensive pursuit.

Birds of Sea and Shore

By BELLE A. STEVENS

And members of the American Nature Association Expedition to British Columbia

SWOOPING in graceful, lilting curves above the surface of the water, darting across its face, standing in solitary watchfulness by the water's edge, perching in crevice and cleft of seaside rock, the birds of the sea and shore are a fascinating group. Gull, merganser, cormorant, pigeon guillemot, kingfisher, great blue heron and others—they are birds apart, living in lands of vast silences and by turbulent waters.

Various were the members of this group of birds found by the American Nature Association expedition into the waters and wilds of the northwest coast. Often they were the only visible sign of life beyond the members of the party, and they made welcome although frequently distant company. Strange were their haunts and stranger still their modes of life.

Isolated from the abode of man in the northern part of Puget Sound lies Gull Rock and its slightly less rugged neighbor, Flattop. In the latter days of June, when the sun plays on the blue-green waters of the Sound, the many little islands and the more distant rocky shores with their evergreens, when the morning sky is blue and a haze lies along the far-off hills, the glaucous-winged gulls are for the most part absent from their haunts near the seaport towns. They have flocked to these and other rocky islands. If a boat with visitors swings in near the point of Flattop seeking a landing place, great and small, the gulls rise from both islands and send forth their discordant cries of helpless disapproval. They swoop down towards the approaching boat and then glide gracefully off, only to return, for invaders are entering their nesting domain here in the solitude of these shores apart from civilization.

The islands are uninhabited save for the birds and a few rabbits. The upper levels of Fattop are sparsely covered with trees and shrubs, but Gull Rock is practically barren except for dry moss, lichen and the scattered, sturdy little cactus plants. One must step carefully to avoid the gull's nests. Many of them are scarcely hidden from sight, merely bits of moss, grass, sticks and leaves rounded into a big or little concave mound with two or three large mottled eggs blending well with the surrounding rocks. Perhaps a few little, downy, greyish-white gulls have pecked their way out into this hard world to wabble about awkwardly, for even a grown gull's grace comes largely with flight.

If approached, they lie absolutely still until the invader is almost upon them. Quite without cover, they are concealed by their spotted upper parts with stripes

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THE THREE GRACES

Even a full grown gull's grace comes largely with flight through the sea air.

of greyish-black. The adult gulls are irreconcilable and glide warily overhead, seldom coming to rest except when out of sight, perhaps on the other side of the little island. When the danger is well past, if the mother thinks herself unobserved, she may return to disgorge a smelt or other small fish. The youngsters are then thoroughly alive and mostly mouth. The parent lavishes great attention on the

PHOTO FINLEY

KINGFISHER ON THE ALERT

With arrow-shaped body and strong wings, he is equipped as a fisherman.

young, the while repeating a few notes of endearment in her limited vocabulary.

The boat moves off. Gulls glide gracefully back and forth. A few sit sedate upon the ledges of the precipitous rocks. Lovely, motionless things they are, their great yellow bills in contrast to the pure white and grey of their plumage. So solemn are they that by their very sereneness they seem to rebuke the intruder. The waves of the incoming tide rush in and recede, rather gentle, still insistent, as in a passive mood they swirl and swish about the base of the rocks. Fluffy white clouds are strewn aimlessly across an otherwise clear blue sky. A calm is over all. As from the distance come the weird, minor notes of the gulls, it would seem they have a song to sing, though only harsh sounds result. Is it not possible that they, in constant companionship with the ocean waters, voice a classic of the sea to which we of the land may not have our ears attuned?

But we go on to meet more of these sea birds. The salt bays and inlets of British Columbia are not frequented by many ducks during the nesting season. During the spring and fall migrations, many flocks are sheltered in these waters, but in midsummer the one duck typical of the locality is the American merganser, sheldrake or fish duck. It is not surprising that the merganser selects this country of many waterways as a place to raise her children, for here she has a choice of sea fish, or she may follow up fresh water streams to inland lakes.

When one is paddling along in a canoe or cruising into the lakes and lagoons, an old mother merganser is quick to hide her young, and one is sure to see her winging overhead, reconnoitering and occasionally quacking and signalling to her brood to keep hidden until she returns with the news that the coast is clear.

Young sheldrakes cannot fly until they are pretty well grown, but this does not hinder them from

PHOTO FINLEY

GREAT BLUE HERON

Solitary fisher of the coastal waters who knows the art of fishing quietly.

getting away easily when pursued by a boat on the open waters, for they flap along rapidly over the surface, beating the water with their wings like little side-wheel boats. When pressed, they dive deftly and bob up a long way to one side or even to the rear. One day a mother merganser was seen with several ducklings that could not have been more than a few days out of the eggs. Launch and rowboat started in pursuit, for the flock promised a picture. Mother was at a loss whether to leave the

ducklings and decoy the monsters off, or to stick with them. She redoubled her energies and tried to do both, flapping off to one side till the rapidly moving launch passed her, then swinging quickly to the other side to lead the rowboat away. Adroitly she got her little ones near enough to the shore so that, when they were pressed hard and becoming winded, they could dive and hide in the loose rubble of the beach. Her ruse worked with all but one of the babies, who tried to change his hiding place, was caught, and had to pose for his picture before he was let loose to join his mother.

The mergansers are quick divers and can catch swift and elusive fish in the water. They are often called "saw-bills" for sharp "teeth" incline backward on the bill and hold a fish no matter how slippery and squirmy he may be.

The cormorants, or shags — sometimes called "nigger-geese" — are hungry feeders where the sea is fertile with fish. In these northern waters there is boundless provision for this appetite. Several species of cormorants inhabit these inland passages, but the one we found along the cliffs, especially at Deep Sea Bluff, is the Baird cormorant. Its long neck and greenish-black, shiny coat easily identify it, but patches of pure white on the flanks afford the best mark of recognition during the breeding season.

For nesting, the Baird cormorant does not select the top ridges of the sea rocks like some of the larger shags but takes the most inaccessible crannies of the sea wall. It is extremely hard to interview him at close quarters and, if one tries to approach, he wags his head from side to side and soon drops off into space, circling around two or three times and then settling off in the sea until the intruders depart.

Perhaps the pigeon guillemot or "sea pigeon" is the most characteristic water bird of the inland passages along the British Columbia coast. One who has his eyes open for birds cannot fail to see these here and there in singles, pairs or in small groups, bobbing up and down with the endless motion of the water. As one approaches in a boat, the little pigeon may dive and reappear some distance away, or he rises readily from the surface, flies off a distance, and slides back into the water. He has a peculiar habit of "standing up on his tail" in the water and flapping his wings as if it were a pleasurable yawn, and stretch. During this display, or when he is in flight, the white patch on each wing is a distinctive mark, varying from his coat of sooty-black. A nearer view shows that his feet are deep red in color, as well as the inside of his mouth.

PHOTO FINLEY

READY TO INVESTIGATE THE WORLD

Kingfishers like to burrow homes in clay or sand bank near the water.

The pigeon guillemot likes a cave or burrow to nest in. Where there is a sandy, clay or gravel bank, he digs a tunnel, or in a rock cliff he makes a home back in a crack or crevice. Where nest sites are few, he takes a little shelf which may be rather exposed, but he much prefers to be hidden more from view. In a conglomerate rock wall, sometimes a boulder is dislodged, and this makes an ideal niche for a pair of guillemots.

Along many of the inaccessible rock cliffs, we found these little sea pigeons going and coming, busy with home duties. The nesting season for a sea pigeon is later than many of the other water birds and eggs may be found any time in June or July. They are beautiful in pattern, dotted or splotched with black or rich brown over a background of light green or buff.

The kingfisher and great blue heron are both solitary fishers of the coastal waters, both knowing the art of fishing quietly. The kingfisher has his regular watch-towers above the marginal waters, and with his arrow-shaped body and strong wings he is equipped like a professional fisherman. The great blue heron or crane still fishes in the shallows, standing as motionless and patient as a stick. A minnow swims past, and there is a lightning flash of the pointed bill that pins him a few inches below

(Continued on page 184)

Plant Today for Tomorrow

By CHARLES LATHROP PACK

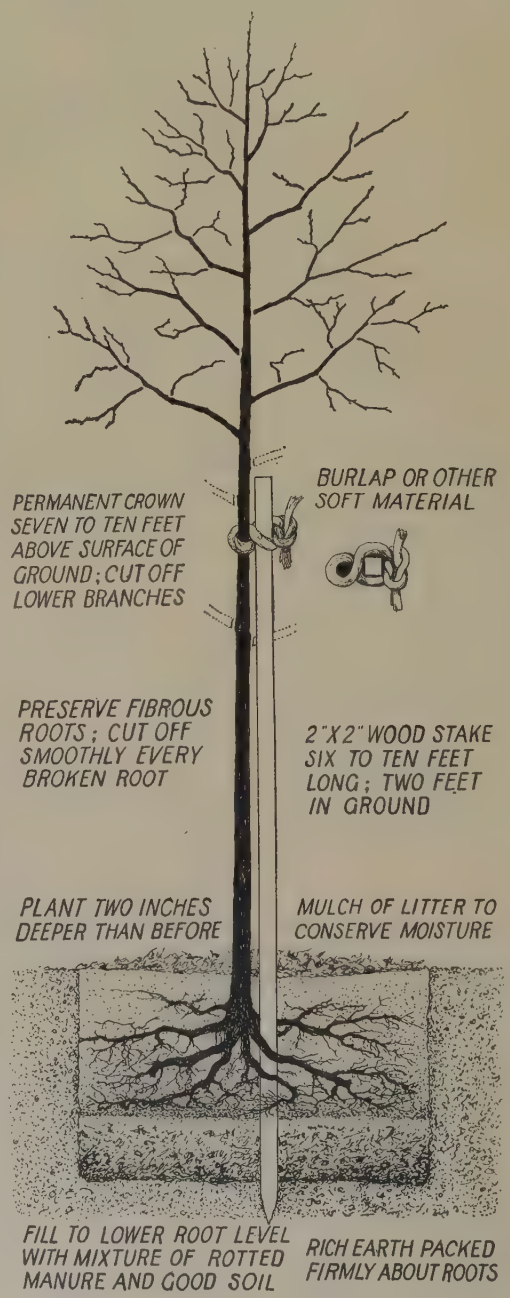
President, American Tree Association

IN NO year during the half century in which we have been moving slowly but surely toward a forest policy for our country has the attention of our people been focused more on trees than in the year just passed. Now, as we prepare to turn the corner of the first quarter of the century, we may confidently expect a tree-planting activity in 1925 that will outstrip all records.

Trees as vital in the healthful living in the out-of-doors was emphasized by the National Conference on Outdoor Recreation. Trees as a fundamental of our daily life was stressed at the Forest Utilization Conference. Discussion of the advisability of the Christmas tree drew the attention of millions to the fact of a declining forest resource. Many meetings, national, state and local in scope, discussed trees and forest. And, perhaps the crowning event of the year was the enactment into law of a real forest policy through the McNary-Clarke Act.

All of these events, and more, have placed before the American people the picture of a tree. It is a scrawny tree, diseased and broken limbed, for it represents our forest resources as compared with our needs from the forest. Then the citizen looks out of his window at the healthy, sturdy, beautiful elm, oak, maple or pine in his yard or growing along the roadside. This tree is a symbol, too, for it stands for what can be if we plant, conserve and carefully utilize.

So with the coming now of tree-time and the season of Arbor Days, the people of the United States are undertaking a work of tree planting unequalled in the past. Its people are dedicating trees to individuals, to achievement, to the beautification of highways and grounds, to the service of the future, in beauty and wealth. North, south, east and west, women's clubs, patriotic groups, citizens' societies, business organizations, young and old, school children and parents are joining this year to make it a real tree-planting year. The American Tree Association has received thousands of requests for tree-planting instructions and Arbor Day programs, and will register thousands of tree-planters in the swelling ranks of the Tree-planting Army.


PERMANENT CROWN SEVEN TO TEN FEET ABOVE SURFACE OF GROUND; CUT OFF LOWER BRANCHES
BURLAP OR OTHER SOFT MATERIAL
PRESERVE FIBROUS ROOTS; CUT OFF SMOOTHLY EVERY BROKEN ROOT
2"X2" WOOD STAKE SIX TO TEN FEET LONG; TWO FEET IN GROUND
PLANT TWO INCHES DEEPER THAN BEFORE
MULCH OF LITTER TO CONSERVE MOISTURE
FILL TO LOWER ROOT LEVEL WITH MIXTURE OF ROTTED MANURE AND GOOD SOIL
RICH EARTH PACKED FIRMLY ABOUT ROOTS

So, in tree-time, let us help by outlining a few simple rules for so planting the tree that it may prosper and grow strong. Selection of the kind of tree to be planted is important, and consideration must be given to the soil available, the climate and the location of the tree. Trees of long life like a sycamore or an oak are frequently to be preferred over the shorter-lived trees like the poplar or silver maple. Then, too, it should be considered whether the tree is the type that will require large space to develop and whether the location that has been selected for it will assure this.

Experience has proved that it is generally more satisfactory to buy nursery trees for planting, although frequently young trees may be transplanted from nearby wooded sections. Evergreens five feet in height and hardwoods up to twelve feet, nursery raised, are generally accepted to give the best results.

In preparing for planting, care must be taken of the tree, for the roots should not be bruised or allowed to dry. Moist earth must be kept around them just before putting into the ground, and any bruised or broken root stems should be pruned cleanly with a sharp pruner. The top of the tree can be shaped up at the

same time that the tree is put in the ground.

As a general rule for when trees can best be planted, it may be said that all trees except evergreens can be put in the ground at any time during the period between their going to sleep in the fall and their spring awakening, so long as the ground is not frozen. In the north the spring is the best time for the inexperienced planter. Late spring, late August and early September are best for evergreens.

If there is any freedom in the selection of the day for planting, a cool and cloudy one is the best. The hole prepared for the tree should be large enough to take in the roots, extended normally. It should be deep enough to allow the placing of about six inches of good loam as a base and the soil should be worked around the roots with a pointed stick. It is well to soak the soil around so that the tree will stand firmly, and no air spaces should be left. Most trees should be placed in the ground about three inches lower than they were in the nursery or growing naturally in the woodlot.

Spaces that are to be left between trees can be fixed by no definite rule. Along the sides of highways the planters must be governed by the kind of tree, and the growing space it needs. Save for roadside trees it is as well to plant trees close, allowing the pruning out of the ones that crowd.

Pruning the tree should be taken care of as soon as it is in the ground, providing that it has not been done before. There can be too little pruning, and the tree-top should be made to balance the root system. Trimming to the leader or main shoot is frequently best with deciduous trees, although this leader itself should not be pruned back. It is undesirable, save in the case of some cedars, to prune the tops of evergreens at planting time.

PLANT TODAY

Once the tree is in the ground, it becomes a question of care. The support of a stake against strong winds and the protection of guards for trees along streets are advisable. For at least two years the soil around the base of the tree will need cultivation, and pruning with growth is necessary, although governed by individual judgment and the shape of the tree.

These are simple pointers about planting trees. Let us plant many this year. The American Tree Association will send suggestions and an Arbor Day program for a two-cent stamp. It will register the planter in the Tree-planting Army, whose ranks are swelling with those who know what trees mean in beauty and in use to our nation.

Pine Nuts for Food

(Continued from page 149)

umbrella tops. In the meantime the lower branches and thinned-out trees yield firewood. From their twenty-fifth year on the trees yield from one-fifth to one cubic meter of cones every year.

Not only does the house of Salviati pride itself in its forestry achievement with its pine-nut domain, but it has developed its beauty as a forest garden. Within the last century many exotic trees have been planted, and along streamside glens grow splendid California redwoods, red gums, Carolina and white poplars and the red or bald cypress of our Louisiana swamps. Deer, pheasants, wild boar and rabbits are plentiful in this protected and cared-for forest.

The world-wide enemy of the forest, fire, is carefully guarded against in the Salviati forest. After a warm, dry summer a blaze would run through the mat of pine needles on the forest floor. Eighteen rangers are kept permanently to do the forest work, and in the danger season ten more are added to protect against fire.

It is possible that some day the pine that is of so much profit to the Salviatis and to Italy may be introduced into the United States in similar climates and conditions. Parts of the south or southwest, or, possibly, California, may be found suitable for growing this remarkable member of the pine family. It requires a warm climate and can stand long, dry periods and relatively little rainfall, and apparently thrives in sandy soil. At least it is well worth experimenting with in our country.

A Dreadnaught in Flesh

By CARROLL LANE FENTON

MILLIONS of years ago, in that part of the earth's history which is called the Age of Reptiles, the country which now forms the wind-swept badlands of the Red Deer River of Alberta was a great, swampy delta on the border of a shallow inland sea. Back of the delta were higher lands, with a few hills; across it flowed sluggish, muddy rivers that drained into weed-choked swamps and marshes, and eventually reached the sea. On the dry ground between the swamps grew forests of ferns, palms, figs, and other tropical trees.

Through these ancient jungles and along the margins of these old swamps and rivers there roamed countless thousands of strange reptiles. Some of them were small, almost like birds in their delicacy of form. Others of them were twenty or more feet in length, with huge heads and long, sharp teeth—some of the most powerful flesh eaters that ever have lived. Still others of them had webbed feet, strong tails, and broad, duck-like bills. They were quite harmless, running from danger instead of fighting. They lived on the water plants of the marshes and spent much of their lives in keeping out of the way of their huge, flesh-eating relatives. Nature was no kinder in the Age of Reptiles than it is today, and wherever there are animals that eat meat there are other animals who serve as food. And for these, existence is little more than one long series of hair-breadth escapes that eventually end in death.

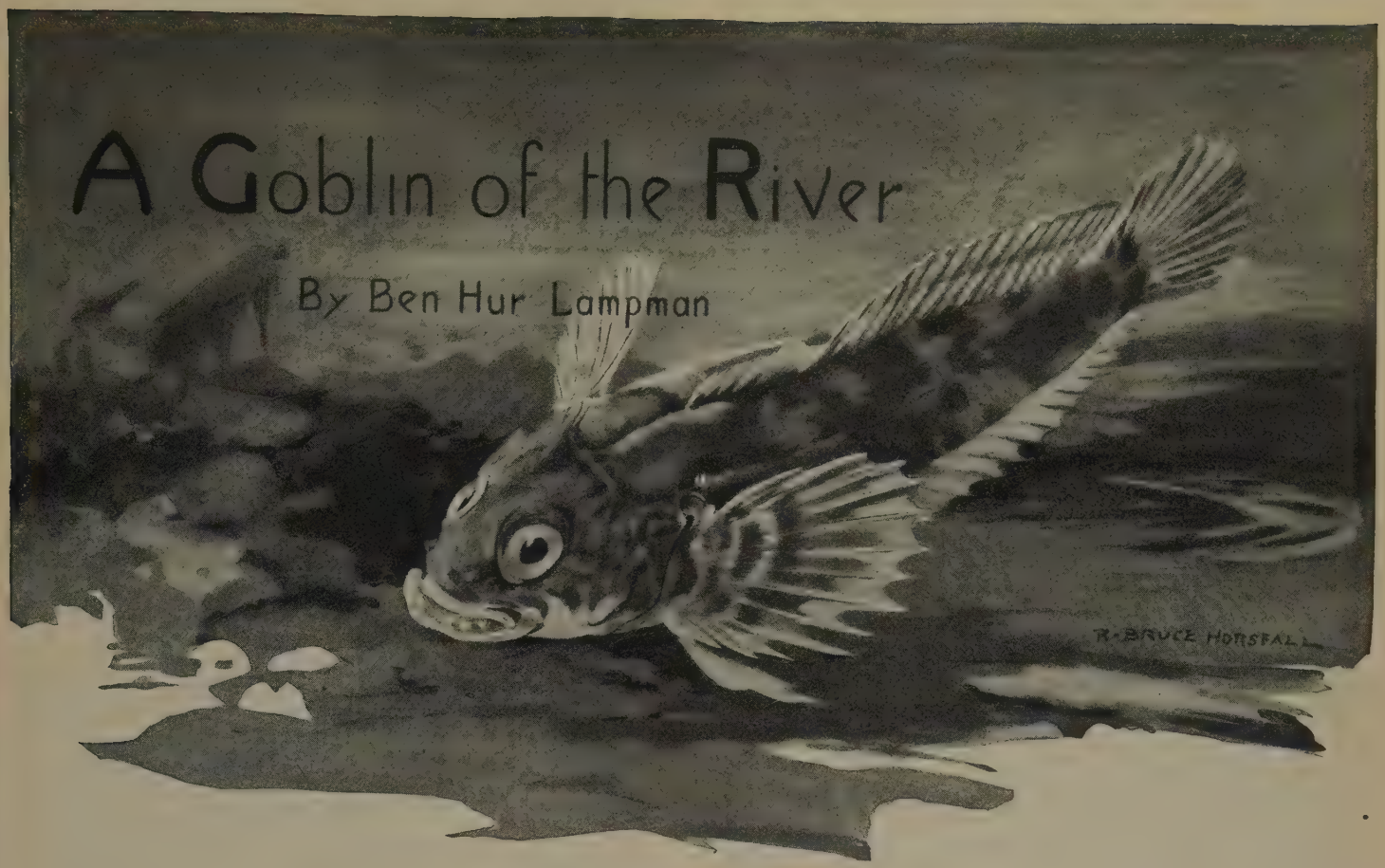
PALAEOSCINCUS BY NAME

Drawing of this prehistoric animal dreadnaught based on the restoration by Mrs. E. M. Fulda and scientists of the American Museum.

But there was at least one reptile dwelling in the old delta who did not either kill or run away; like the porcupine of modern woods, he ambled about unharming and unharmed. Palaeoscincus, the "Dreadnaught Dinosaur," was built solely for safety; there was nothing either swift or beautiful anywhere about him. His body was shaped a good deal like that of the Texas horned toad, magnified several thousands times. He was broad and flat, with a long tail, short, heavy legs, and a small but thick head. His upper parts were covered with a thick, leathery skin, into which were set thousands of bony armor plates, most of which were arranged in transverse rows. Along each side, beginning on the neck, was a row of heavy, sharp spines—some of them more than a foot in length, and branched.

When he walked, Palaeoscincus must have looked a good deal like one of the sword-studded war chariots of ancient Rome. Even his head was protected by plates, and heavy sheaths guarded his eyes, nostrils, and jaws. When the animal drew his legs under him and squatted down on the ground he must have been as thoroughly protected as any creature could hope to be. All exposed parts were mantled in bone and spines, and he was too heavy to lift and too broad and flat to turn over. Even the Tyrant Dinosaur, the largest flesh-eater that ever has walked, must have been powerless to harm this distant relative of his.

And so the Dreadnaught Dinosaur lived a life of very lazy peace, waddling through the mossy jungles or sunning himself on the banks of the muddy streams. When he was hungry he clipped off leaves with his horny lips and chewed them between his almost useless teeth. When he was thirsty he could find water almost anywhere. He never hurried, and never ran; when danger approached he merely lay down and waited for it to pass. Probably he did not even go to the trouble of fighting for a mate.



FEW fresh-water fishes are candidly ugly, for nearly all are redeemed by a grace of outline, a fluency of fin and flank and tapering structure that lends even to the grotesque a certain comeliness. The catfish is not an Adonis to the grudging eye, yet the lines of the catfish are graceful, and the fish itself moves with a fine coordination of fin and body. Taken from roily waters, where the skin pigment has essayed to counterfeit the flood, the catfish often is as one touched by Midas—a creature of yellow gold. And the catfish, save for one other, is the least personable of our fresh-water fishes. Well, they cannot all be trout, with the shimmer of dreams upon them.

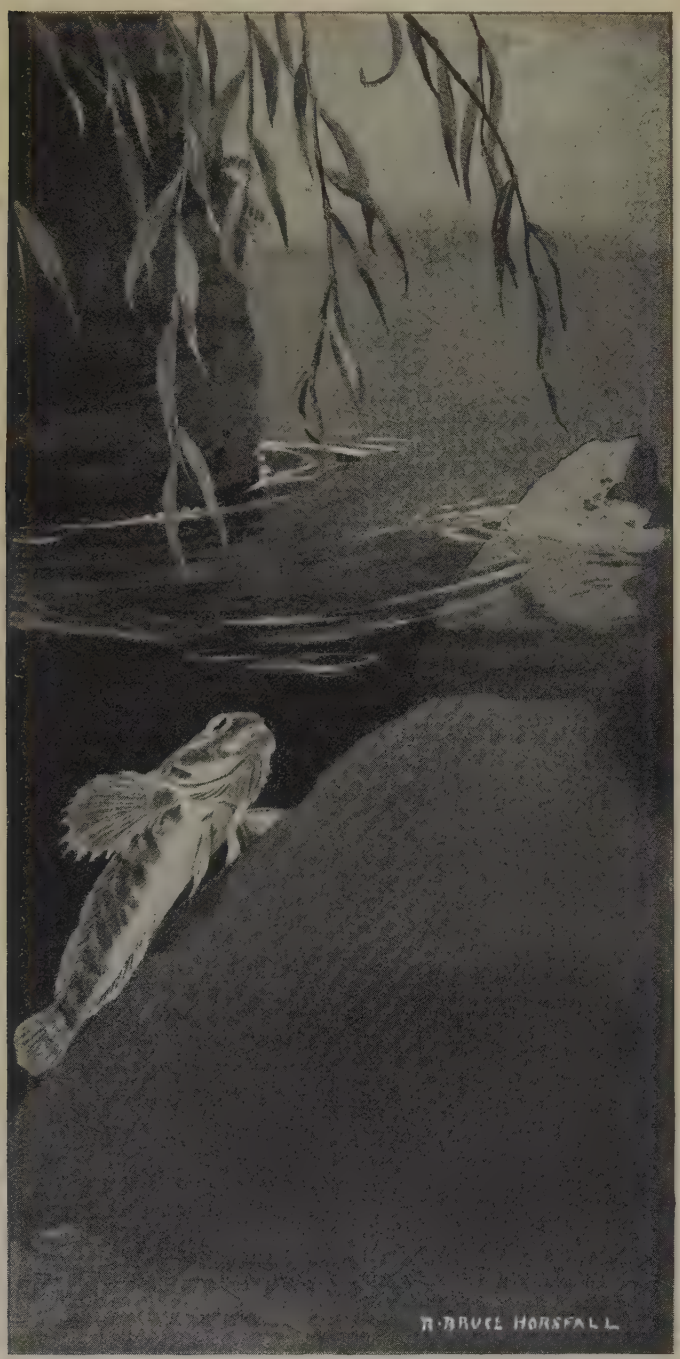
If you were called on to award the palm for superior ugliness among lake and river dwellers, and assuming that you knew the fellow, beyond doubt you would nominate the sculpin—the "mudcat" of western parlance. This fish, if he thinks on it, has a definite complaint against creation. His ugliness is so singularly unrelieved. Doomed to haunt the murky bottom of the lake or stream, to find retreat in rocky caverns and the gray tangle of sunken drift, the sculpin is a goblin of the depths. While it is true that his larger cousins of the sea are far uglier, we have sound reason to know the genius of ocean for the shaping of both extravagant beauty and things of nightmare. But to find in some clear current of mountain water such a fish as our preposterous friend, is, at the first, to have the sensation of dreaming.

Observe the flattened disproportionate head, with its gnome's eyes goggling upward the better to descry a watery world above it. By the generous gape of that mouth the sculpin is a glutton of capacious appetite, fashioned to wait for such rank spoils as the river may consign to him. He does not wear in any feature, nor in the poise of the body, the air of alertness common to species that have discovered the adventure of living. He is fashioned for sluggish thought and groping forays and, this being conceded, he is an entirely efficient mechanism.

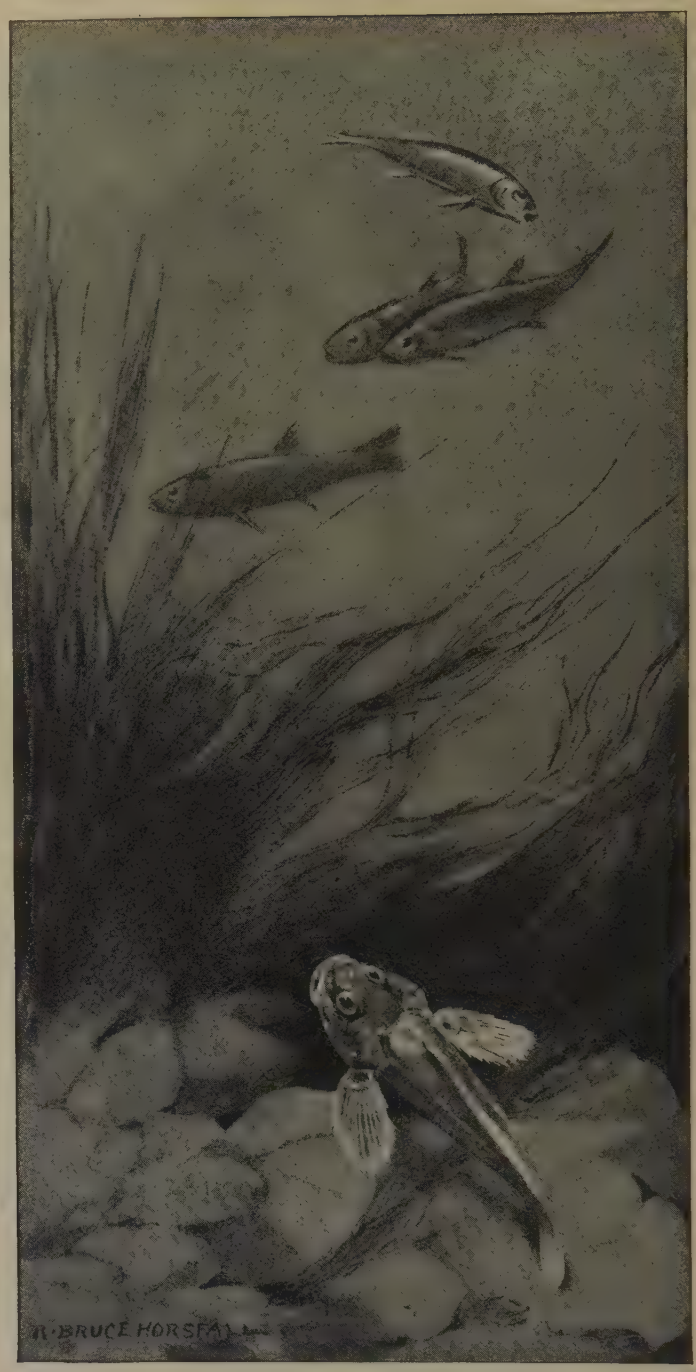
The spiny dorsal fin of the sculpin, when erected, is seen to be wanly barred with gray, and in two curves, a greater and a lesser, it sweeps back to the weak and fan-like tail. The rounded body tapers narrowly away from the huge head and the paunchy stomach. The anal fin likewise is long and rounded, and delicately, obscurely, traced with grayish bars. Well to the fore are the ventral fins, and they scarcely are fins at all—being stiff spines with but a scant edging of tissue. Is it not possible that the goblin, lacking the mobility of other fishes, the

instant answer to effort, thrusts these sharply downward when in haste, and so aids his cumbersome body to rise and respond? Indeed, since he stands in need of them, there really is no good reason why a sculpin shouldn't have crutches.

It is evident that the chief propulsive fins of the fish are the pectorals, its most distinguishing feature. These spread in rounded fans, like the wings of a butterfly, at right angles to the squat cranium, and are broad as the head of the goblin himself. And they are curious fins. At a stroke they send him scuttling forward, to see what food has fallen at his door, or in reverse they draw him gingerly



"FINS LIKE ROUNDED FANS"



"CREEPS SLYLY FORTH"

into his crevice again. In some respects they are strangely like hands. And, pray you, why not a fish with hands? We shrink from sharing this bond with him. There are tropic fishes that clamber over gnarled roots when the tide is out, to bask in the sun. As for our sculpin he is forever hitching himself along the flanks of his favorite rocks, and since he cannot poise in midwater like others, it may well be that he finds these odd pectoral fins of some advantage in his mountaineering—some strange utility all but hidden to us. For the pectoral rays are soft and pliant, and each ray terminates beyond the web itself, in a brief tentacle most unpleasantly

suggestive of a finger-tip. One feels that such a fin as this was not expressly designed for swimming. The homely little second-story worker.

Nature was at some pains to conceal the sculpin, knowing that his lack of speed, as his dearth of pugnacity, must make of him a fair target for any questing trout. Our goblin cannot brood in his cave interminably, any more than a mortal hermit. He must out now and again to see what offers in the way of provender, or answer the call of the freshet and become a migrant on his own account. And certain hazards are toward whenever he does. So over his toad's hide, swart and scaleless, rough and rasping to the touch, the good dame has painted a mottled mixture of clay-browns, and lunar-greens, and pallid, sedimental grays. Dark patches rest saddle-wise on the back of him. Vermiculated green shines sourly along his splotched flanks. You look twice, and thrice, before you discern him as he hugs the silt. A rock, not a fish. A fragment of water-worn wood at rest on the bottom. And now you begin to make out the whole unlovely outline, the goggling eyes, the goblin head, and now he moves jerkily forward—the epitome of stupid dubiety. Alarm him as he pauses, and if there is no refuge nigh he may give you proof of his versatility. Not always will he flee. The stout little body vibrates, with a flurry of fin and a sweep of tail, and when the roiled water clears you must be sharp of eye. He is all but hidden in his native silt. Not much of a fish, perhaps, but surely a curious one.

Fitted to forage in the ooze for lowly creatures and the refuse of the river, it is nevertheless probable that the sculpin has his high ambitions. When a school of midget minnows cruises over his lurking place he is at once on the alert and creeps slyly forth by a succession of nervous, hesitant hitches—avidity in every furtive movement. Now he would launch himself—now!—but the infants are away on the whim of the moment, saved from the belly of the goblin. Yet at times the sculpin must surely levy toll, else why the eagerness of his regard?

There was once a sculpin—and a moody fellow he was—that dwelt in a goldfish bowl, quite surrounded by odious sunlight, in which he grew pale as a wraith, if ever a wraith was mottled. The goldfish, flashing by on lazy fin, mouthing and gaping above him, gave him no thought whatever, after the manner of carp. But as they drew near to the sculpin it might have been observed that he twitched with desire. He trembled ominously and bent his tapering body to a stiff curve. When the fated moment came he dashed outward and upward and seized the golden prey, mumbling it until the water was flecked with tiny scales. Unhappy goldfish, most phlegmatic of carp, not to have known the evil of that fixed stare! Since the captive was half as large as the captor, his terror tore him from the gripping jaws to win a gasping death upon the surface. The sculpin came to rest. Was there the trace of a leer on that squat countenance? It was such a tragedy as the river must often witness where sculpin foregather. A mendicant in the mud, but as fierce a beggar as ever carried a cudgel.

In the fecund waters of the Gulf, where sea-life is of almost fabulous girth and hunger, there lives a sculpin so vast as to compel respect—a goblin desirous and fully capable of preying upon man. And this should make us all the more content with the one we have.

Guy C. Caldwell

KNOWN through the country as a naturalist, lecturer and nature entertainer, Mr. Guy C. Caldwell has joined the staff of the American Nature Association and its companion organization, the American Tree Association, as Lecturer and Field Naturalist.

Mr. Caldwell is a lecturer of long and wide experience. He has built up one of the most valuable collections of photographic studies growing out of tree-surgery work. He has a remarkable collection of motion picture films of wild life, and his autochromes of western wild flowers form one of the most valuable groups in the country. Mr. Caldwell is noted as a whistler and imitator of birds. He has made studies of the flora and fauna of this country and Europe, where he resided for seven years.

In view of the tremendous work to be done for conservation and the need of speakers to address women's clubs, schools, farm groups, clubs, commercial associations and other gatherings, the directors of the two associations are particularly pleased to announce Mr. Caldwell's addition to their staff. His address is: Lecture Department, The American Nature Association, 1214 Sixteenth Street, Washington, D. C.

Catkins of the Spring

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

"THE ALDER by the river shakes out its powdery curls." To garden-fed folk the first true touch of the new spring is in the hardy snowdrop, a spring elf from the snows of the Alps. To those who roam the fields as winter's snows disappear there is even more positive proof in the catkins on many of the bushes in meadow and swamps. Though they are not very exciting as floral bouquets, yet many days ahead of the gaudy Forsythia of gardens, these early flower clusters are proof positive that the season of flowers and birds is with us again. No one plants any of these as garden ornament, few people note their dull flower clusters, but because they appear so early, even in advance of more showy flowers of some foreign shrubs, they are worthy of our appreciation at the end of every winter.

Several shrubs burst into activity in mid-March. The Alder leads in size of its flower clusters among shrubs, though the April catkins of some of the Aspens are even larger. Clusters of red-brown catkins held stiff and half erect all the winter now quickly become limp, lengthen out, grow lighter in color, and send out clouds of yellow pollen at every jar. There are two species of Alder in our northern swamps, very much alike, and only a botanist bothers with the difference. The Smooth Alder (*Alnus rugosa*) has leaves bright green both sides, and grows in every wet spot from Maine to Texas. The Hoary Alder (*A. incana*) has its leaves much paler below and ranges from central Canada to central United States. There is really no difference in the looks of the pollen-bearing catkins, though the Smooth Alder is the first to toss out its yellow dust. The tiny clustered female catkins at the end of the twigs are erect, however, as are the old dried black cones of last year, still on the plant, while the female catkins on the Hoary Alder are drooping at the tips of the twigs, and the dried cones point downwards rather than up.

There are several tree Alders in our northwest, and others in Europe and Asia, worthy of planting as ornamental trees, with similar but larger dust-scattering catkins swinging out in April. Nobody

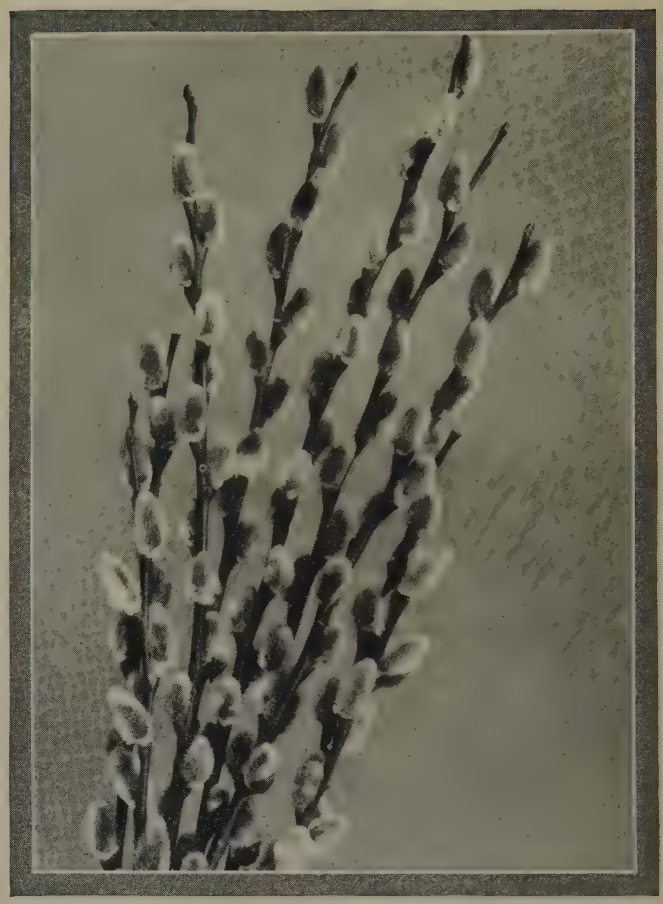


PHOTO J. HORACE MC FARLAND CO.

QUEEN OF SPRING CATKINS

Pussy willow, truly one of the most popular of American shrubs.

PHOTO J. HORACE MC FARLAND CO.

ALDER IN THE SPRINGTIME

By the river it "shakes out its powdery curls."

is so foolish as to plant our two eastern species. They indicate every stream and swamp, and are most effective when shaking their yellow dust down the neck of the early fisherman. If these shrubs were as common in England, we should have heard of this matter from Izaak Walton. Twigs cut in February or early March will blossom out in a day or two, but the yellow pollen on the table linen is not so pleasant a feature.

PHOTO J. HORACE MC FARLAND CO.

ALDER IN SPRING DRESS

The smooth Alder is the first to toss out its yellow dust.

Up in the dry fields, smaller, paler catkins shake out more yellow pollen. These are the Hazels, and, again, there are two kinds much alike. The Common Hazel-nut (*Corylus americana*) is the earlier and the more common species. It is taller and the young shoots are red-brown with pinkish hairs. The Beaked Hazel-nut (*C. rostrata*) is much less downy in twig and leaf, but the chief difference is in the queer long tubular overcoat that covers the nut, while the common species has a leafy fringe around the nut. Neither species has any value except for squirrel food in autumn and catkin bouquets in early March. There are other Hazels from Europe and Asia, more treelike and furnishing edible nuts. They are frequently planted, and their big catkins make as great a show and cast as much pollen as any Alder.

PHOTO J. HORACE MC FARLAND CO.

CATKINS OF BIRCH

Another of those whose spring dress promise summer soon.

Little yellow flowers in tiny clusters appear on some of the bushes in the swamps and along the streams with the Alders. This is Spice-bush (*Benzoin aestivale*), and by snapping a twig to smell or taste you can be sure. The medicinelike odor and flavor are unlike that of any other plant, and slightly like that of its cousin, the Sassafras. This is the only American shrub in the swamps with real early spring flowers, for you can't call catkins flowers. Looking closely you will see that the flowers are not all alike on all the bushes. The large flowers are the male blossoms, with nine stamens, the three inner ones smaller. On another plant the flowers are smaller, though just as yellow, and the twelve or more stamens do not function, while in the middle a globose ovary with curved snout waits to grow into a red berry for next September. Its local name of "fever-bush" recalls that once this was used to allay fevers, but the oil is of chief value in upsetting the patient's stomach. Though no longer of curative value, it still may be used in patent medicines, for its flavor makes it appear to cure something. Though not planted in small gardens, the Spice-bush is now being much used in parks, especially where the soil is moist, for it is a shrub of good habit of growth for mass of twigs and shiny rounded leaves. The Hairy Spice-bush (*B. melissae-*

folium) lives in the swamps from Illinois to the Gulf. Its leaves are more narrow, the twigs densely downy, and the spring season finds its little flowers ready in February.

After all, the one flower of late winter is the Pussy Willow (*Salix discolor*). With all that the botanists have done to the willows we hesitate to say which this or that one may be, but the Pussy Willow in early spring, or even midwinter, is quite plainly marked by its big rounded white catkins. Very early in the winter its one brown bud-scale gets pushed aside by the expanding catkin, and the snowy little pussies sit on the twig until warm March days allow them to grow suddenly longer and more fluffy, and send out yellow stamens that turn the white pussies to gold. Picked from the field, the brown scales, the yellow pollen and the defunct pussies soon litter the table, but the bouquet was entertaining while it lasted. By keeping these twigs in water they shoot leaves above and roots below, and in May they may be set out in the garden to grow your own pussies. This is truly a popular American shrub. There is scarce a plant in field or swamp, whether in pasture or city park, that does not each winter show the plucking of eager hands of nature lovers. Even florists now plant the bush as a paying crop, for the natural supply of winter pussies soon gets exhausted near our cities. It is a very easy shrub to grow in any soil, except a sand bank, and a twig kept in water a few weeks at any time of the year will soon grow enough roots to be set out. Your troubles will begin when your neighbors want your pussies.

Other species of Willow have white winter catkins, as the Prairie Willow (*S. humilis*), the Sage Willow (*S. tristis*), and others of dry fields, but the catkins are much smaller, later, as the leaves unfold, but these shrubs do not transplant well. Many of our larger willows have small white catkins, and some European species are quite snowy with their little winter pussies, but none have the size or hardihood of our own neglected Pussy Willow.

Evening Skies in March

(Continued from page 167)

light. This is one of the many interesting objects in the heavens that can be well seen with an opera glass. Another name for it is "The Manger" and the two faint stars that flank it on either side are known as "Aselli" or "The Donkeys." As the least gathering of vapor in the atmosphere hides it from view we find that the ancients considered it a sign of storm when The Manger became murky or dim.

Rising above the southern horizon at this time we see a portion of Argo Mavis, The Ship Argo, which the legend tells us was built for Jason, leader of the Argonautic Expedition in quest of the Golden Fleece. After the successful completion of its voyage the ship was supposed to have been placed in the sky. This is one of the largest and finest constellations in the heavens containing the second brightest star, Canopus, which is not visible in the mid-latitudes of the northern hemisphere, however. So huge is this constellation that for convenience it has been divided into three, Vela, The Sails; Puppis, The Stern; and Carina, The Keel. It contains many brilliant stars and interesting objects and is crossed by the Milky Way, which in this part of its course becomes very wide and irregular and has many dark lanes and "holes" or "coalsacks" in it known to be dark nebulas, seen against a brilliant background of stars.

To see this wonderful constellation to advantage a trip at least as far south as Cuba is necessary.

Returning to our own skies, however, we find many brilliant stars worthy of our admiration at this time of year. The many first magnitude stars of winter, Aldebaran, in Taurus; Capella in Auriga; Betelgeuse and Rigel in Orion; Sirius, the brightest of all the stars in Canis Major; The Greater Dog, Procyon in Canis Minor; The Lesser Dog, and Pollux in Gemini are now all in the western half of the sky. To offset this brilliant array of stars in the west we have but one first magnitude star in the eastern sky, Regulus in Leo; though Arcturus, the orange-hued star in Boötes, which ranks with Capella in brightness, will very shortly appear above the northeastern horizon in Boötes.

This contrast between the brilliant array of stars of winter in the west and the stars of spring appearing in the east is very great. In the western sky we also have the planet Mars, which will be in this part of the heavens for several months yet, though it is decreasing in brightness steadily and swinging away from the earth. To see Jupiter and Saturn we must be up early in the morning before sunrise. Venus will be too close to the sun to be seen this month or next. On the twenty-first of this month the sun will cross the equator going north and spring will begin.

In the northeast we now find the Big Dipper high in the heavens and we can readily find the North Star, Polaris, with the aid of The Pointers as is shown on the chart. Everyone should be familiar with this method of finding the true north, for some day one might be able to turn this knowledge to advantage. While looking at the Big Dipper some clear night see if you can find Alcor, the little companion star of Mizar, the star at the bend in the handle of the Big Dipper. This was a test of good eyesight among the Arabs. In fact Alcor comes from an Arabic word that means "test." It is surprising how many cannot see this little companion of Mizar though it should be easily seen by one having fair eyesight.

As the Big Dipper swings higher up into the northeastern sky the "W" in Cassiopeia which has been such a familiar object in the heavens since early fall, draws nearer to the northwestern horizon and though it does not set in our latitudes will soon be too near the horizon to be seen to advantage.

Birds of Sea and Shore

(Continued from page 175)

the surface. Light refraction of the water is deceptive to one looking from above at a fish under the surface, so it is experience and judgment that counts with these birds that hunt and fish for a living.

The kingfisher, like the pigeon guillemot, likes to dig a burrow in a clay or sand bank not far from the water. The sound of his rattling call is easily distinguished from other bird notes. His frowsy head and coat of blue are striking marks. The great blue heron is just as easily recognized as the kingfisher because of his stilt legs and long, curving neck. In nesting habits, he is remarkable in adapting himself to circumstances. As a rule, he nests in colonies and is just as much at home with his big platform nest in the tall top of a fir tree in the northern woods as he is in the southern lake region, where he nests on the ground in the midst of the swamp.

The Field Notebook

THE FIELD excursion for nature study is beset with pitfalls, mostly of the social sort. The hilarity, which naturally takes possession of a bevy of youngsters let loose in the fields or woods, in itself militates against serious work. On the other hand, a field excursion harnessed and driven under the whip of discipline loses its value as an educational activity, whatever it may achieve as a "means of grace" (the gentle term used by our Puritan ancestors for disagreeable experiences). The ideal state of mind for the young excursionist is to feel hilarious because of the joy of the "hike" and to be interested because he has a definite desire to go somewhere and see something that he has not seen before which makes the excursion a special quest of his own. A thrilling memory of our childhood reverts to an excursion of three or four of us to see and examine a crow's nest which was in the top of a rather forbidding old hemlock. Only one of us achieved the difficult climb, but he made such full report that the rest of us felt from that day on that we knew all about crow's nests; of innumerable excursions this one has always been remembered most vividly. There should be a "crow's nest" as the objective of each "hiker," and the problem is, how to bring this about in the case of children who have no definite interest in wild life.

There are several ways of attacking the problem, and one of the most efficient is through the field notebook. For the beginner, undoubtedly one of the notebooks with outlines directing observations makes for efficiency. These nature questionnaires are also helpful to advanced pupils who desire to accumulate definite information. We know a certain eminent professor of biology who, on going to a region where the flora was unknown to him, took a sixth-grade plant notebook and filled out the answers to the questions carefully; he came home jubilant with accurate observations upon twenty-five or thirty plants, all of his notes easily available.

However, there is much to be said for the field notebook that is blank paper to begin with; such shows where the child's attention impinges upon the life about him. It is a flower here and a bird there, now a tree and now a squirrel and now a floating thistledown that he saw and noted. We treasure an accumulation of such notebooks, some of them thumb marked and untidy and some of them suspiciously neat; some copiously illustrated with little enigmatical figures and some with pictures beautifully drawn and colored. Each one in the collection represents a child in the fields, seeing what interested him sufficiently to jot down an observation in his very own book, a book that he need not show to anyone unless he choose.

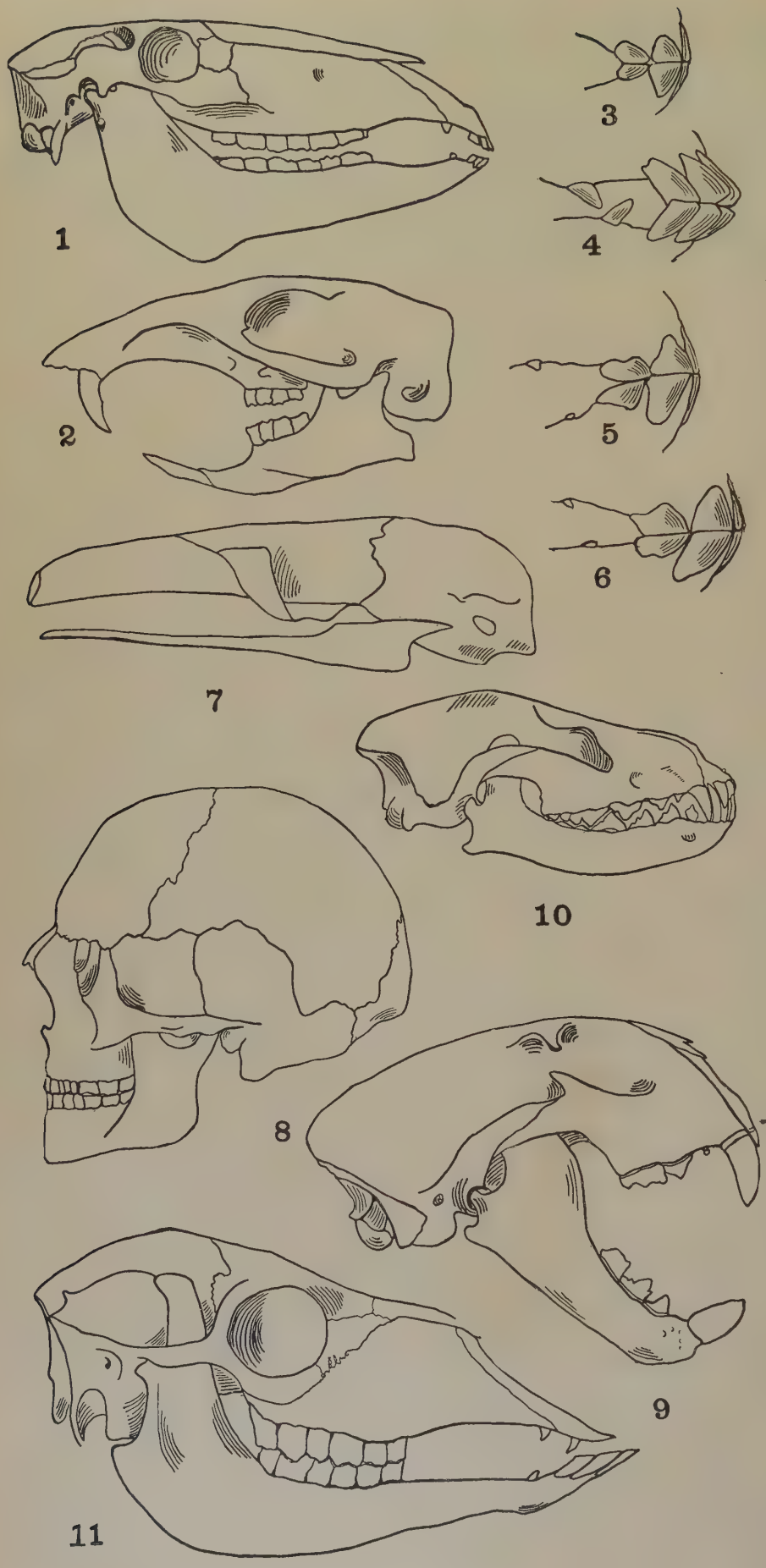
One of these books with soiled covers shows a page in the writing of a "third grader" that says, "I saw a mushrat swimming in the dam and when he swum he used his tail funny most like he was steering with it." This is a gem of an observation, and no doubt that boy is now a biologist of note. In contrast with this book is one that was given over to the study of autumn flowers and was made by a little miss in the fifth grade; each flower is illustrated in water color and through the book are scattered stanzas of Helen Hunt Jackson's *September*. "The golden rod is yellow" on one page, "The gentian's bluest fringes are curling in the sun" on another, and still another shows how "Asters by the brookside make asters in the brook"; and over many pages were scattered yellow butterflies. The joy of creative work resulting in beauty shines out of every page of this notebook, where there are more pictures than written notes, for it was through the pictures that this child gave expression to her interest and knowledge.

One great value of the field notebook is psychological in that it influences the seeing, hearing and thinking along definite lines. The child might see a little gray bird feeding on weed seed beside the road and that would be all; but as soon as he makes a note concerning it, he sees more than a gray bird; he notes the eye streak, or wing bar, the color of the breast or the flash colors; and the kind of weed that furnishes seed for the bird's repast must be identified. He may see a blue flower but, as soon as he attempts to describe it in his notebook, he must note the number of floral parts, the character of the stem and leaves, and where the plant is growing. Often a few strokes of the pencil save pages of description, and this is the ideal method of self-instruction in drawing; for the pupil voluntarily uses this graphic means of expressing what he sees, because it is the quickest and best way to tell the story.

Henry Thoreau's notebooks are remarkable examples of ideal note-taking in the field. His interests were many and his knowledge so wide that necessarily his books show a wider range of observation than could be expected of anyone less wise in nature lore; his drawings, too, should encourage us to try to illustrate what we see, for they are primitive and crude but always graphic, and show just what he wanted them to show.

To make note-taking spontaneous and of greatest value the child should have absolute possession of his notebook and should not be required to show its contents to the teacher or to anyone else. As a matter of experience, most children enjoy showing their notes to anyone interested. Most pupils treasure their notebooks.

The notebooks should not be used compulsorily in language work. If the pupil chooses to expand his notes on a bird or tree or both to make a written exercise in English, all well and good; yea, all good and best, but this should be voluntary.



Practical Nature Puzzles

By E. LAURENCE PALMER

IT IS a simple matter to see a squirrel put nuts in his mouth and conclude from that fact that squirrels are able to put nuts in their mouths. It might not be so simple to pick from a pile of skulls you might find around an owl's nest, the skull of a squirrel that might put nuts in its mouth. You might possibly say that you could use the size of the skull to help you, not realizing that a very young rabbit might have a skull somewhere near the size of the squirrel's skull.

Many of the most interesting things about animals that existed on the earth before the history of man have to be interpretations of remains much less instructive than skulls. The solving of these puzzles of nature is in many ways one of the most intensely interesting phases of nature study. For the benefit of those who like to solve puzzles I have shown here some of the simpler ones which you may enjoy solving between now and the time the April NATURE MAGAZINE comes. The answers to these practical puzzles will be published at that time and a new set given to work out for the following month.

It might be convenient to write, after each of the questions here asked, the number of the figure which you think is appropriate.

Which of the skulls shown on this page belong to each of the following mammals:

The cougar that pierces deeply into its prey of mammals and birds? No. (9)
The horse that grinds its food of grain and hay after biting it free from the ground? No. (1)
The wolf that holds and tears its food of flesh? No. (10)
The man who eats both plant and animal food and has great intelligence? No. (8)
The ant-eater that eats soft insects? No. (7)
The chipmunk that gnaws nuts and may carry food in its cheeks? No. (2)
If number 11 eats plants, write 1; if it eats flesh, write two. No. (1)

Numbers three, four, five and six show the nippers of an animal like that owning skull number 1. These nippers may be of great importance in telling you how old the animal is. The older the animal is the more developed will be these teeth and the more evidence will there be that their working surfaces have been worn down.

Which of the nippers shown belong to a four-year-old animal? No. (3) 3
Which of the nippers shown belong to a five-year-old animal? No. (5)
Which of the nippers shown belong to a six-year-old animal? No. (6)
Which of the nippers shown belong to the oldest animal? No. (4)

Read the text carefully and then answer each question by putting the numbers in the parentheses. The answers will be published in the April issue of NATURE MAGAZINE. This is not a contest, so do not send in your answers. Save them and see how nearly right you were.

On this page are some eyes, teeth, tails and feet of mammals. Most of them may be easily understood. Some may prove to be more difficult. This may give exercise for a few of you.

Numbers two and three are the eyes of two squirrels.

Which eye belongs to a red squirrel that is active by day? No. (2)
Which eye belongs to a flying squirrel that is active at night? No. (3)

Numbers one, four, five, six and seven show a side view of the lower jaws of five sheep of different ages. Sheep have baby teeth which are replaced by permanent teeth much as we do. These permanent teeth may become worn down in age.

Which jaw belongs to a lamb that has all of its baby teeth? No. (4)
Which jaw belongs to a yearling that has shed its first baby teeth and had them replaced? No. (7)
Which jaw belongs to a two-year-old sheep? No. (5)
Which jaw belongs to a three-year-old sheep? No. (1)
Which jaw belongs to a four-year-old sheep? No. (6)

Numbers eight to twelve show the tails of various mammals.

Which belongs to a squirrel that can climb safely about trees? No. (10)
Which belongs to a beaver that swims in the water? No. (12)
Which belongs to a horse which is frequently annoyed by flies? No. (8)
Which belongs to a deer-mouse which may climb safely about trees? No. (11)
Which belongs to a meadow mouse which does not commonly climb about trees? No. (9)

Numbers thirteen to twenty show types of forelimbs of mammals.

Which belongs to the mole that digs in the ground for insects? No. (14)
Which belongs to the bat that lives exclusively upon the insects it catches in the air? No. (15)
Which belongs to the squirrel which holds food in its paws? No. (20)
Which belongs to the sea-lion that lives in the sea? No. (19)
Which belongs to the sloth which hangs head downward from the branches of trees? No. (18)
Which belongs to the horse that is at its best on hard, firm ground? No. (16)
Which belong to the cow which can walk over soft ground with comparative safety? No. (17)
Which belongs to the cat which holds its prey of birds with its claws? No. (13)

Hints to Nature Readers

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers and other readers on how to use them, is proving most helpful in Educational Work

The Wit of a Red Squirrel East or West young America may have a Nature lesson on the red squirrel, and in either locality the story of the Douglas squirrels on Mr. Finley's place will add spice to an already zestful topic. Emphasizing the ingenuity of the red squirrel in his removal of the apples from a closed cabin and his escape from his pursuer after stealing the robin's eggs, the story tells also of his indefatigable forest planting, his sure-footed use of trails through the tree-tops, his nest and winter larder, the kinds and distribution of red squirrels, the variations in the coat of the chickaree, his "mocking-bird" accomplishments, and the bad habits which sometimes tempt one to destroy him despite his work as a forester. The problem presented in the last three paragraphs is an excellent subject for debate among children of Junior High School age. It may be stated in the words: "If we eliminate some species that appear detrimental, we may destroy Nature's equilibrium, and are likely to have greater difficulties than before." The illustrations teach squirrel ways as truly as the text.

* * *

Coconut, Citizen of the Tropics Contribution to a school museum, and preparation of special exhibits are activities of much educational value genuinely enjoyed by children. The geography class will find the products of the coconut a varied collection not difficult to gather together. Coconut oil, oleomargarine, cooking fat, soap, liquid soap, coconut shreds, mats, brushes, floor coverings, and gas masks are a few of the possibilities. A study of the home of the coconut leads into all tropical countries. The size of the annual crop, the theories as to how the trees have spread from one land to another, and raising coconuts for market are interesting matters for discussion. Investigation of the development of fiber and outer husks for the protection and possibly the distribution of the kernels within is a project for the Nature class.

Birds of Sea and Shore Depending upon location and the consequent bird life of the neighborhood, glaucous-winged gulls, mergansers, cormorants, pigeon guillemots, kingfishers, and great blue herons may be studied from the live creatures which form a part of the child's environment, or from stuffed specimens and pictures, as inhabitants of other regions. In either case the article furnishes interesting reading matter from which much may be learned of the habits of these birds, especially with regard to nesting and the care of the young, and their special adaptations to their mode of life.

* * *

The Deer of the Kaibab The balance in Nature, so delicately adjusted, so easily disturbed, and so readily observed in such places as the brook, the forest, or the garden should be studied by the Nature class, for upon an understanding of it all intelligent conservation depends. Having seen for themselves that plant, insect, bird and animal life is worked out on a plan of checks and balances, the children will appreciate the story of the deer of the Kaibab, which tells how the measures applied for their protection have resulted in numbers for which the food supply is inadequate.

* * *

The Story of the Wind Weather study is not complete without consideration of the wind. A lamp chimney, set upon two parallel matches over an inch of lighted candle, proves by the movement of the smoke from a bit of smouldering punk held under its edge, the circulation of air due to the expansion of heated air and the pressure of the cooler heavier air. Similarly circulation of air may be studied round a stove. From such homely experiments the currents of air from the equator to the poles and back again can be explained. Depending upon the age of the class, the complications which vary these currents may be studied in more or less detail. The names of winds may be studied.

Pine Nuts for Food A study either of evergreens or the uses and management of forests will be enriched by this account of the ancestral forests of the Duke of Salviati. How the ripe trees are cut in successive crops, how the young trees are thinned, the measures used to prevent fire, the development of a forest garden, and above all the harvesting, threshing, and marketing of the pine nuts are a record which the young student of trees or of forestry will enjoy reading, and repeating to his fellow students. The suggestion that the umbrella pine might be grown with equal profit in the United States is one worth the consideration of young folks and grown-ups alike.

* * *

Dutchman's Breeches With the approach of spring opportunities for outdoor Nature Study increase, and in preparation for wildflower trips the class may run through the files of NATURE MAGAZINE for wildflower articles. From these the children may select the flowers found in their own locality, note the time of their appearance, and familiarize themselves sufficiently with them to have a basis for recognition when the plant is discovered out of doors. For instance, in the article on Dutchman's breeches a student finds a description of bulbs, foliage, and flowers, which, with the photograph, make identification a simple matter.

* * *

Catkins of the Spring Bouquets of alder, hazel, spice-bush, birch and pussy willow twigs brought into the house or schoolroom will blossom out in a short time, lending a seasonal touch to indoor decoration as they announce with their catkin banners the approach of spring. Pollen is so abundant in the staminate catkins that pollination becomes an almost self-evident fact, and teaching the reproductive process is not only natural but inevitable. Keep the pussy willow twig until it develops leaves and roots, and then plant in May.

Bear and Deer

What happens when a tender little deer meets a hungry big bear on the trail was the question that F. W. Schmoe, Park Naturalist of Mount Rainier National Park, had often asked himself; and this is his story of what happened when he was an unseen spectator at such a meeting:

"Down a little path came a young buck stepping gingerly along with head held high. As I watched I saw, approaching from the opposite direction, a brown bear. Due to some large trees along the winding path the two did not see each other until less than a half dozen paces separated them; then, rounding a big snag, they came face to face. Now it is entirely possible that this particular bear was hungry and that he had never heard of the golden rule. What more could one expect than that Bruin should strike down this bountiful feast so providentially provided and enjoy some fresh venison; but that is not what happened. The peaceful scene immediately became one of animation, but it was no gory combat that I witnessed. With amazing speed for one so clumsy, Bruin turned and climbed a tree, and the leisurely gait of the buck became one of wild flight in the opposite direction. Fifty yards away the deer stopped and looked back, then wandered off into the woods. The bear, after a few seconds, descended and ambled away in the opposite direction."

Goose of Toulouse

Goosedom might be the name applied to the Toulouse region of Southern France, where a million geese a year are raised. The city itself consumes about 100,000 of them. The variety of goose raised there is said to be the largest known, gray of color except for white under parts and a reddish beak. The egg-laying season begins in January and the average laying is about 45 eggs, turkey hens generally being used to hatch the eggs.

A Fine Stewardship

For the past two years the Girl Scouts of Portland, Oreg., have been gathering the seeds of wild flowers and selling them in small packets. This meant guarding and watching the plants throughout the blooming season and the study of the life history of each species, as well as insuring their perpetuation by selling the seeds with directions as to the best methods of planting. Recently the Portland Park Commission formally gave them Governor's Park as a wild flower preserve in which will be planted wild flower seeds and bulbs under expert supervision. These are to be transferred to other parks later.

White Fox and Eider

Many are the fascinating stories and valuable facts brought back from the frozen reaches of the north by Capt. Donald B. MacMillan of the good ship *Bowdoin*. One of these is told to Edward Howe Forbush, of Massachusetts, by the explorer, and sheds some light on the failure of eider production in 1922 on the coast of Canadian Labrador by reason of an invasion of white foxes who destroyed eggs and young. Captain MacMillan said that in the winter of 1921–1922 great numbers of Arctic foxes crossed on the ice from Baffin Island and migrated to the coast of Ungava and Labrador, and even as far south as the Gulf of St. Lawrence. He tells of one Eskimo and his wife who trapped 1,000 foxes —testimony of their numbers—and practically bought out the supply station at Fort Chimo. Having acquired most of the stock and two motor boats, they moved to another post to complete their purchases. The last seen of the Eskimo he was adorned with a gold watch secured by two heavy gold chains. The foxes never returned to Baffin Island, but extensive trapping permitted the eider ducks to raise broods again. Some pinch of famine undoubtedly drove the foxes from their native land.

Londoners Perhaps

Enshrouded in a dense fog some twelve miles out of San Francisco, Capt. O. H. Hansen of the good ship *Admiral Peary* was taking no chances. Of a sudden, out of the gummy fog appeared two strange wanderers, none other than two owls who had sighted the ship through the mass of concentrated atmosphere that the eye of man could not penetrate. They were exhausted when they landed on the deck. Captain Hansen named them Port and Starboard and presented them to Golden Gate Park when he had landed, after the fog had lifted and showed him the way through that famous entrance for which the park was named.

A Rare Bat

Babe Ruth is not the only one acquainted with rare bats, although baseball authorities testify that he swings an exceeding "rare" one. Mr. William Reymann found a tremendous mammal with a twenty-inch spread of wing recently hanging to a low limb of a tree near the Merced River in Yosemite Valley. The animal was stiff with death, having apparently succumbed to the cold, and was identified as a California Mastiff Bat. It is rare, and no record is known of its occurrence north of the Yosemite.

Ernest Harold Baynes

With the passing of Ernest Harold Baynes at his home in Meriden, New Hampshire, the world of Nature lovers has lost a leader; many birds and animals, both individually and in the many, have lost a friend. A facile and understanding writer on wild life, an entertaining lecturer on birds and animals, Mr. Baynes contributed largely of himself in that period when the conscience of our nation was almost dormant in its realization of the need of protecting wild life. His passing will be widely mourned and the service he rendered will be long remembered.

An All-Nature Cross-worder

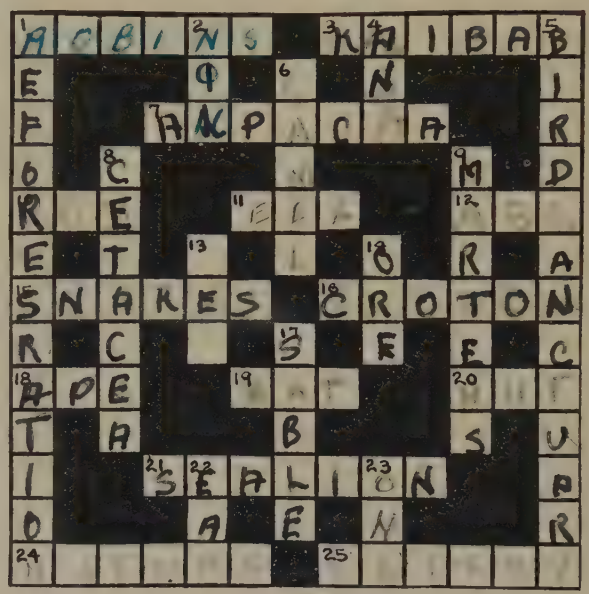
Such was the interest in the February puzzle that the editors have decided to continue the printing of these puzzles, encouraging more delving into Nature lore for the right word.

Owing to the international circulation of NATURE MAGAZINE, however, it is felt advisable not to have a prize contest. Instead the answers will be printed in the subsequent issue. Readers can then keep the magazine intact and take their time in working out the puzzle.

This month all of the words in the puzzle relate to Nature, but look out for eight down and sixteen across.

Across

1—Familiar bird visitors in summer gardens.
3—A plateau which contains a well-known deer preserve.
7—Mammals of the mountains.
10—The egg sac of fishes.
11—That snake-like fish.
12—A proverbial beast of burden.
15—Charmed but not charming.
16—An acrid, viscid oil secured from seeds of a small, East Indian tree.
18—A mammal closely related to man.
19—A flying mammal.
20—Squirrel food.
21—A large marine mammal of the Pacific.
24—A name for all outdoors.
25—Plant whose blanched leaf-stalks are used as a salad.



PUZZLE BY HELEN VON KOLNITZ HYER

Down

1—The nation's attempt to restore one of our most valuable natural resources.
2—Nothing.
4—Initials of a national society of Nature lovers.
5—Something every community should use its unused woodland for. (Two words.)
6—A mammal of the desert.
8—An order of aquatic mammals.
9—Cousins of the chimney swifts.
13—A flesh-eating parrot.
14—A native compound containing metal.
17—A small animal hunted for its fur.
22—The fruiting spike of a cereal.
23—Being a single individual.

The February Puzzle

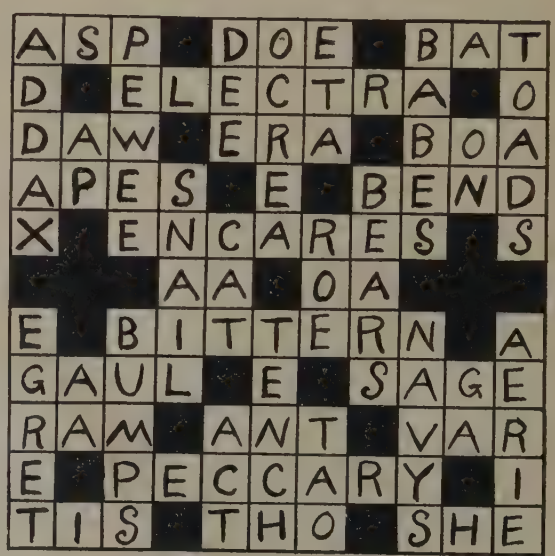
The eagle's nest proved out of the reach of many of the contestants, who spoiled otherwise perfect answers by rendering it "eerie" instead of "aerie." We'll grant that an eagle's home may be a bit weird, but our much consulted dictionary insists on our spelling.

Which brings us to the announcement of the winning answers submitted by:

Howard E. Harris, Chester Ave., Riverside, N. J.
Alfred James, Picture Rocks, Pa.
Mrs. F. P. Strong, Greenville, S. C.
David Ebert, Wilmington, Del.
Olive Clevenger, 2479 East Main St., Columbus, Ohio.

BUT to **EVERYONE** who submitted correct answers there is being sent in the same mail as the March issue a copy of "The Forest Poetic," an attractive booklet of poems of the woods and trees.

In thanking everybody for their interest, the Cross-Word Puzzle Editor will testify that there are many puzzlers who read NATURE MAGAZINE.



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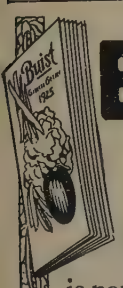

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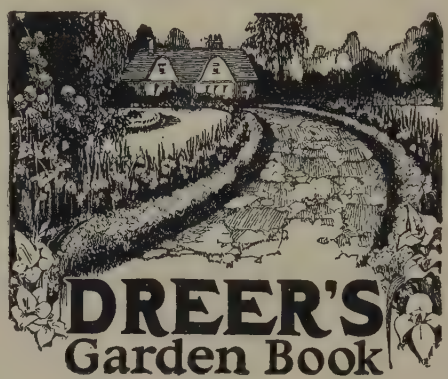

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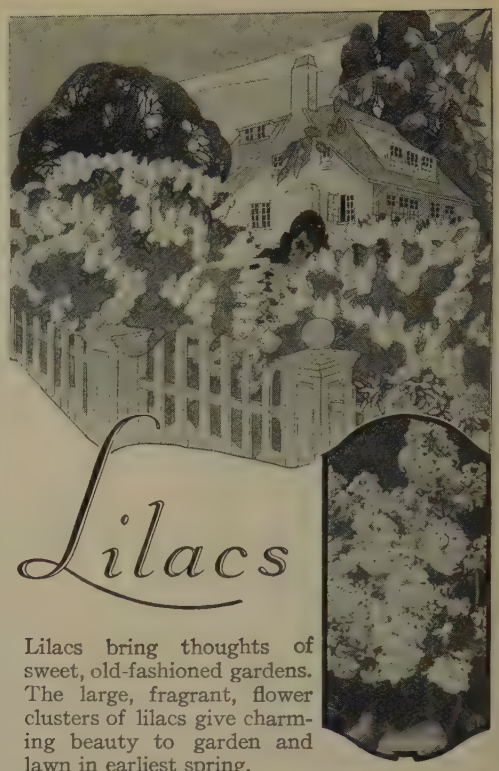

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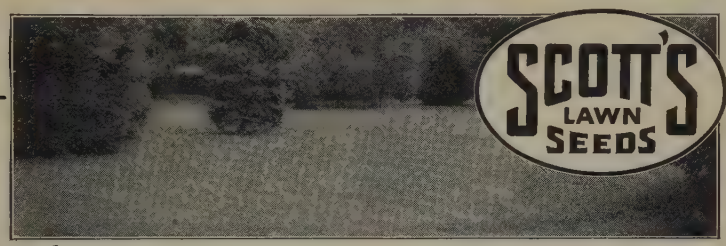

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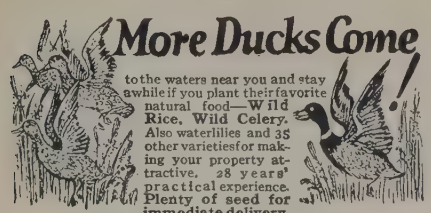

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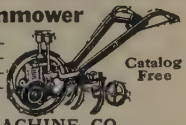

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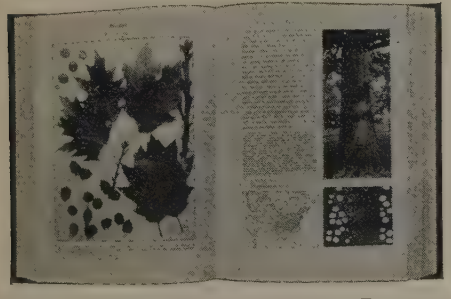

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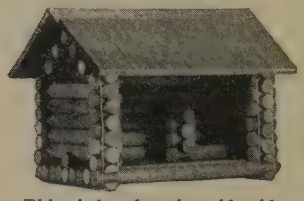

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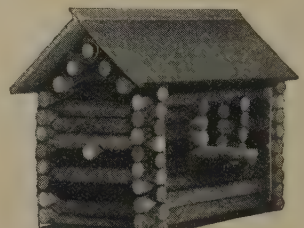

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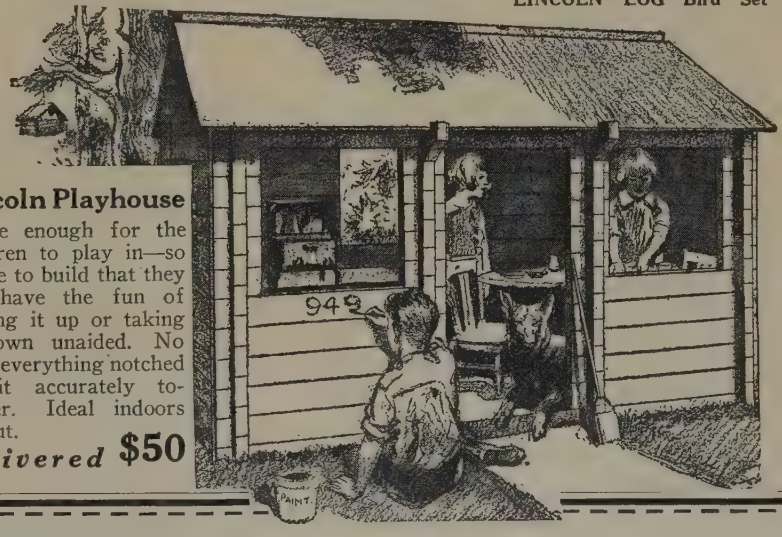

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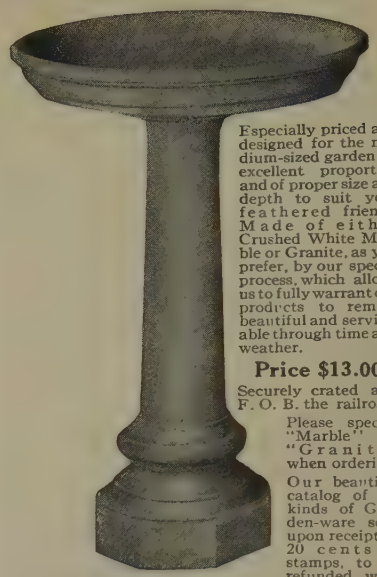

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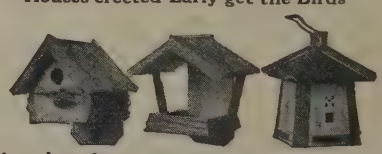

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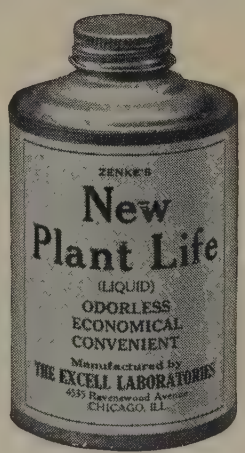

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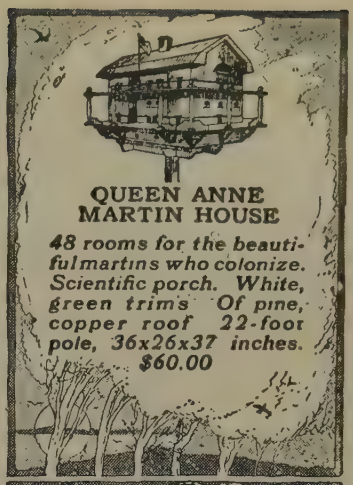

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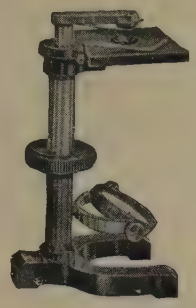

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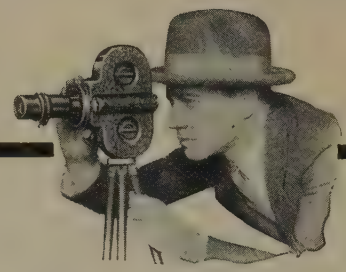

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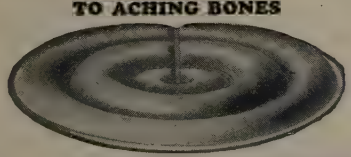

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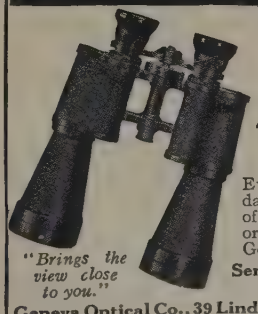

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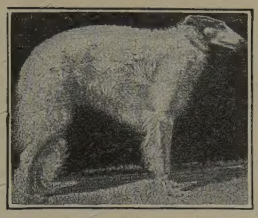

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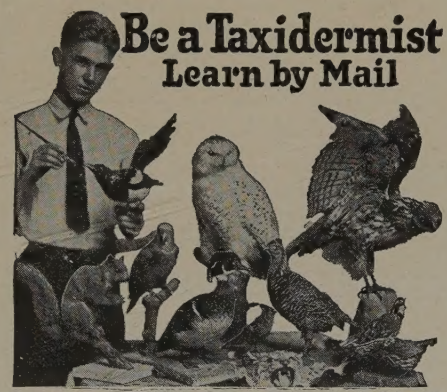

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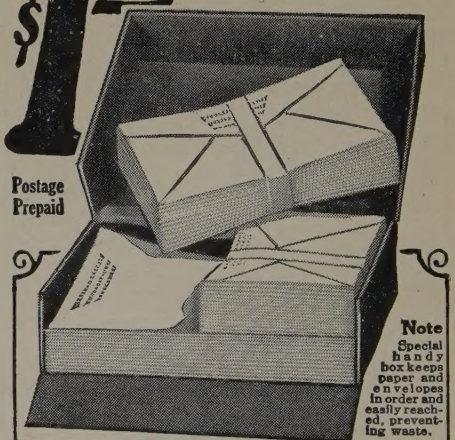

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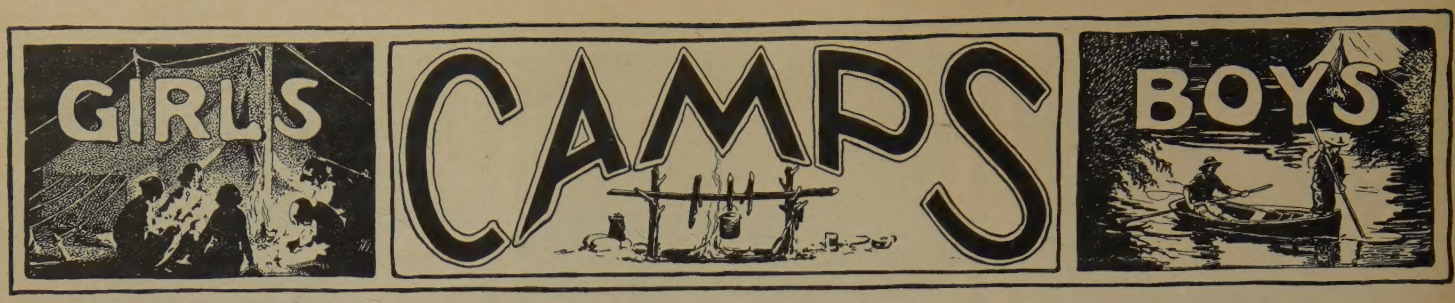

Girls Girls Girls

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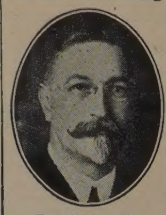

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THE TREE-PLANTING ARMY

Plant a tree and erect your own monument for your friends cannot find a better one.
—Charles Lathrop Pack, President, American Tree Association.

All through the South the tree-planting campaign has been under way for some time and thousands of new recruits are joining the tree-planting army. The first week in February and before is the time the planting is done there.

One of the outstanding plantings was that of the Atlanta Women's Clubs, who placed peach trees along Peachtree Street in that city where it passes the women's famous club house, one of the most beautiful club houses in the country. Mrs. T. T. Stevens, the president of the club, heartily indorsed the plan, of course, and Mrs. V. S. Kreigshaber was the leader in carrying out the plans. Mayor Sims, of Atlanta, was so interested in the project that he proclaimed a tree-planting day, and Russell T. Edwards, director of the educational section of the American Tree Association, on the invitation of the Atlanta club women, attended the tree planting. They are now planning to make the road to Stone Mountain a Road of Remembrance.

Because of a tour of the South lasting three weeks Mr. Edwards can inform the thousands of members of the tree-planting army that they will have to establish some new records because of the early start of the tree planters in the South.

At Jacksonville, H. H. Hume, of the Civitan Club, working with the women's organizations, has plans under way for beautifying the roads in and about that city. Every Civitan in Jacksonville is to become a member of the American Tree Association or, according to President E. W. Lane, stand a heavy fine.

At Rome, Ga., the most remarkable dogwood-planting campaign is on. This city aims to be the dogwood city of the world, from what has been done as outlined by Secretary Foster of the Chamber of Commerce, that promise is well within sight of accomplishment. The idea there is to make dogwood so plentiful no one will want to pick it and destroy it. At the Berry Schools near Rome a remarkable plan of instruction is going on in behalf of forestry. There the boys and girls live and work in the trees of this seven-thousand-acre tract. The approach to the main executive building, planted with rows of trees by Martha Berry years ago when she was ridiculed for it, now make a remarkable Road of Remembrance in honor of that woman's remarkable work.

A five-mile Road of Remembrance is being financed by the women of Meridian, Miss. Every citizen of the city is to have a part in the planting, and the state officials have staked the road to be planted, which is a part of the National Highway. The trees will be placed in honor of those who answered their country's call in the World War. At Jackson, the capital of the state, the tree-planting campaign is being directed by the forestry chairman of the women's clubs.

But another encouraging phase of the educational work being carried on by Charles Lathrop Pack is the eagerness with which the business organizations of the country are listening to the message that eighty-one million acres of idle land must be put to work growing trees as a vital part of any program having to do with the future prosperity of the nation.

With a tour of the South opening at Louisville, where a talk was made before the Optimist Club, the message has been carried to Rotary Clubs, Kiwanis Clubs, Civitan Clubs in Nashville, Memphis, Little Rock, Jackson, Meridian, Atlanta, Rome, Jacksonville and Tampa. As a fine example of the willingness to listen, the Kiwanis Club of Little Rock invited Mr. Edwards to talk at a district Kiwanis dinner where the program had been made up weeks in advance. There were visiting delegates from a half dozen cities and district officials of the Kiwanis organization from far-away points, yet the forestry message was welcomed and the place made on the program.

The meeting of the Civitan Club in Jacksonville is another example of the interest of the business leaders of the community in the subject of putting idle land to work. In a glass enclosed dining-room on the top of the Mason Hotel, the club listened to the facts that confront the country as regards forestry. These business men are behind big projects for their city and state, yet they give the time to hear other things.

The American Tree Association finds the editors of the country are extremely keen on this subject. They welcome the Forestry Almanac and, in their editorial columns, point out the situation to their readers in no uncertain language when it comes to discussing a national forest policy.

The only way to join the American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage. Make your spring tree-planting plans now.

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